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AUTHOR	Wilcox, M. Jeanne; Norman-Murch, Trudi; Oberstein, Jill S.; Volkmann, Melody A.; Wagner, Deanna K.; Musselwhite, Caroline Ramsey; Malena, Edye; Weber, Carolyn A.
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ABSTRACT

Designed for parents of children who have a wide variety of disabilities, this manual discusses the ways in which assistive technology can facilitate the child's active participation in developmentally appropriate activities and offers ideas for incorporating devices and strategies into daily school and home routines. The manual attempts to present information in a straightforward manner and includes numerous illustrations and mini-case examples. References and resources are provided for people who want to go beyond this introductory information. Chapter 1 introduces definitions and describes assistive technology. Chapter 2 offers a number of common questions relating to assistive technology that parents often have with attempted answers after each. Chapter 3 provides light tech strategies used in the home and the classrooms. Chapters 4 and 5 include information on High Tech strategies, including both augmentative and alternative communication and computers. Chapter 6 introduces the topic of adaptive play, including the adaptation of both toys and games. In chapter 7, the topic of emergent literacy is considered. Each chapter is covered with regard to students primarily in early childhood education and addresses how to make assistive technology functional and easy. (Contains 33 references.) (CR)

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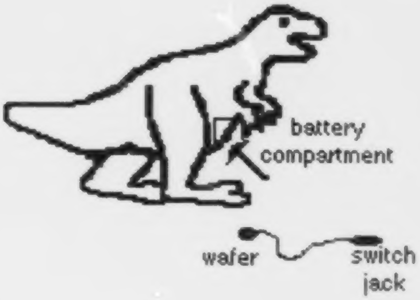
ED 449 606

Assistive Technology: Tips, Tools, and Techniques

A Parent Resource Manual


battery
compartment
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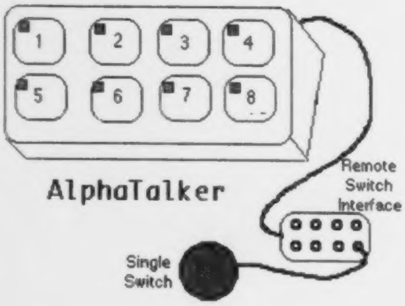
1
2
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AlphaTalker
Remote
Switch
Interface
Single
Switch

A Collaborative Project of
Arizona State University
Tempe, Arizona
&
Southwest Human Development
Phoenix, Arizona

EC 308 313

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Assistive Technology: Tips, Tools, and Techniques

A Parent Resource Manual

This manual was developed by
The Early Assistive Technology Training Project Staff:

M. Jeanne Wilcox, Ph.D.
Project Director
Arizona State University
Tempe, AZ

Trudi Norman-Murch, Ph.D.
Project Co-Director
Jill S. Oberstein, MA, OTR/L
Melody A. Volkmann, MNS, CCC-SLP
Deanna K. Wagner, MS, CCC-SLP
Southwest Human Development
Phoenix, AZ

Caroline Ramsey Musselwhite, Ed.D
Special Communications
Litchfield Park, AZ

Edye Malena, BS
Pilot Parent Partnerships
Phoenix, AZ

Carolyn A. Weber, M.S., CCC-SLP, S-LP (C)
Arizona State University
Tempe, AZ

DRAFT

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Preface

Meaningful use of assistive technology is strengthened when the child's family members, caregivers, and educational team subscribe to a core set of shared beliefs regarding the value of assistive technology. These values affirm that: (1) assistive technologies are tools to enhance the child's capacity to productively engage in daily activities at home, school, and in the community; (2) assistive technology facilitates active participation, independence and inclusion; (3) effective use of assistive technology is related to the Individual Education Plan (IEP) and based on a collaborative team process requiring shared attitudes, consistency and commitment; (4) assistive technology is most beneficial when it is infused across the settings that a child is in (e.g., home, school, daycare), rather than used sporadically or in isolated instances; (5) assistive technology is flexibly incorporated into home and classroom routines, but customized to meet the child's specific needs; (6) the use of technology should be fun, motivating, and meaningful to the child; (7) time will be regularly scheduled for planning and training; and, (8) assistive technology will reduce, not create barriers; therefore, its application will be monitored and reviewed on an ongoing basis.

Making technology "work" for children requires a commitment by family members, caregivers, teachers, and therapists. Teamwork is important. Technology is not a substitute for good teaching and relationships – it is only a tool to provide support.

This handbook is intended to be used by people who are "new" at assistive technology. This might include parents/caregivers and other family members, paraprofessionals, and anyone else who is interested in the information, but unfamiliar with the terminology. The goal is to present the information in a straightforward manner, with as little new terminology as possible, and with numerous illustrations and mini-case examples. References and resources are provided for people who want to go beyond this introductory information.

Chapter 1 introduces definitions and describes what assistive technology is. Chapter 2 offers a number of common questions that parents often have with attempted answers after each. Light Tech strategies used in the home and the classroom are provided in Chapter 3. Chapters 4 and 5 include information on High Tech strategies, including both augmentative and alternative communication and computers. Chapter 6 introduces the topic of adaptive play, including the adaptation of both toys and games. In Chapter 7, the topic of emergent literacy is considered. Each chapter is covered with regard to students primarily in early childhood education and addresses how to make assistive technology functional and easy. However, some of the principles can be applied to children of all ages.

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Caroline Ramsey Musselwhite, Ed.D
Martha C. Lewis

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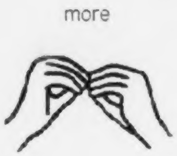
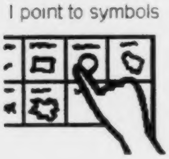
- Amphitheater Unified School District
- Cartwright Elementary School District
- Casa Grande Elementary School District
- Cave Creek Unified School District
- Deer Valley Unified School District
- Gilbert Unified School District
- Isaac School District
- Paradise Valley Unified School District
- Tucson Unified School District
- Washington Elementary School District

I.

What is Assistive Technology?

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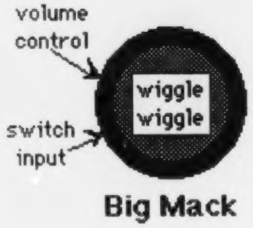
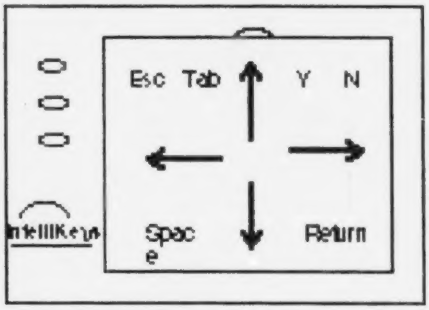
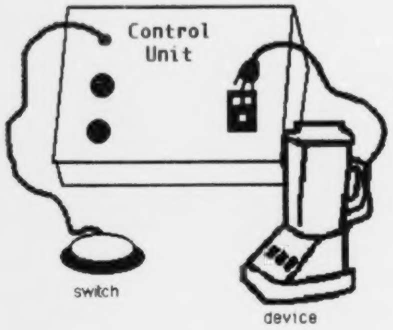
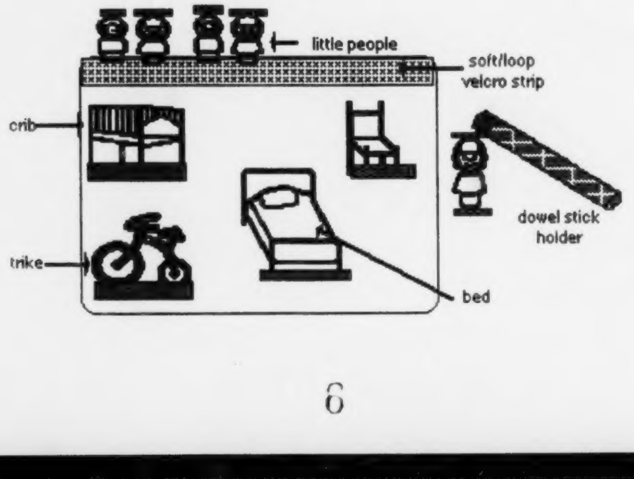

volume
control
wiggle
wiggle
switch
input
Big Mack


Esc
Tab
Y
N
IntelliKeys
Spac
e
Return


Control
Unit
switch
device


little people
soft/loop
velcro strip
crib
dowel stick
holder
trike
bed

INTRODUCTION

Technology can be defined as the application of scientific knowledge. We use technology continually during our daily routine. All work, play, and daily living skills revolve around some form of technology from driving the car to work, to making a cup of coffee, to riding our mountain bike on a trail, and listening to our favorite CD in the stereo.

Assistive technology can be defined as *"any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capacities of a child with a disability."* (Reference: Individuals with Disabilities Education Act Amendments of 1997.) In simple terms it means any device or adaptation which can be used to help a person with a disability engage in a major life activity or perform a desired task that he or she was previously unable to do.

Table 1-1. Examples of Conventional and Assistive Technology

Conventional Technology	Major Life Activity	Assistive Technology
Electric Razor	Self-care	Button Hook, Built-up Spoon Handle
Cellular Telephone	Communication/ Receptive – Expressive Language	DynaVox: Voice Output Augmentative Communication Device
Tape Recorder	Learning	Switch Activated Tape Recorder
Cannondale Mountain Bike	Mobility	Quickie Rx Manual Wheelchair
CD Stereo System	Self-Direction	Jelly Bean Switch with Battery Adapter and Twirl-O Paint Toy
Washer and Dryer	Capacity for Independent Living	Proxi System with environmental control unit modules - Computer control of home appliances
Computer and word processor	Economic Self-Sufficiency	IBM Screen Reader to "speak"

A wide range of materials termed as "assistive technology" can be used to help individuals with disabilities. These may be:

- Purchased from a specialty supply company (e.g., a special computer keyboard with enlarged letters)
- Bought at a neighborhood store (e.g., talking storybooks)
- Modified from standard purchases (e.g., a tape player that is adapted so a student can use it with a switch)
- Created by parents, teachers, or therapists (e.g., a bookstand to hold books in an upright position)

The materials may be used to help individuals with disabilities *increase abilities* (e.g., use adapted scissors to be able to cut with help), *maintain abilities* (e.g., a person with a degenerative condition such as muscular dystrophy use a computer to continue to write letters), or *improve functional capacities* (e.g., communicate through a device that talks to order food in a restaurant).

OVERVIEW OF AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC)

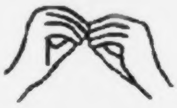
Augmentative and alternative communication (AAC) refers to a wide variety of techniques and assistive devices that may be used to supplement or aid a person's ability to speak and interactively communicate (Burkhart, 1993). The American Speech-Language-Hearing Association (ASHA, 1989) defines AAC as *"an area of clinical practice that attempts to compensate (either temporarily or permanently) for the impairment and disability patterns of individuals with severe expressive communication disorders."*

Simply put, AAC refers to materials and strategies that help individuals successfully communicate. Some individuals have limited communication skills due to factors such as cerebral palsy, developmental delay, stroke, severe oral-motor impairment, or autism. AAC may help these individuals either temporarily (e.g., while a trach is inserted after surgery) or permanently. The use of AAC systems can be used as (1) a primary means of communication when an individual is unable to produce intelligible speech, (2) a supplemental method of communication to clarify speech in unknown contexts and/or with unfamiliar listeners, or (3) a transitional means of communicaiton to facilitate the later development of speech.

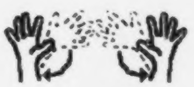
AAC systems are generally divided into two categories:

Unaided communication systems do not require any special aides or devices – they use the person's face, head, arms, and other parts of the body. They include spoken words or word approximations, gestures, eye gazing, and sign systems such as American Sign Language or Signed English.

more

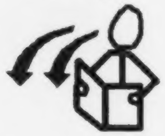


finish

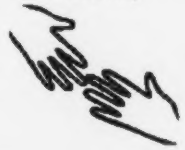


Aided communincation systems require some type of aid or device and include a wide spectrum of low and high technology devices. Examples include a manual picture or symbol board using Mayer-Johnson Picture Communication Symbols.

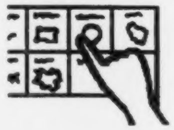
read it again



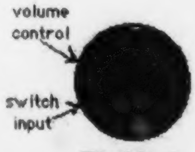
I need help



I point to symbols



Voice output devices are included in this category and are devices that produce speech for individuals who have difficulty communicating. The individual may enter messages in a variety of ways including typing messages, pressing picture symbols or sequences of picture symbols, or



Big Mack

using a switch to stop a moving light at a particular message. Appendix A lists a number of companies/vendors who provide voice output devices.

OVERVIEW OF ADAPTIVE PLAY

Children develop skills, such as problem solving, language, emergent literacy and numeracy, social and self-help skills, gross and fine motor abilities – in the context of play. We know that children learn best when:

- They are actively engaged.
- They are involved in "hands-on experiences".
- Activities are pleasurable.

Adaptive play involves the following:

1. Physical modifications or adaptations to toys:
    - Using magnets attached to the toy and a metal cookie sheet to stabilize the toy and keep it within the child's reach.
    - Using battery adapters and single switches to control battery operated toys.
    - Building up or adding handles to enlarge the grasping surface of the toy.
2. Modifying the play environment:
    - Place the toys and play materials within arm's reach of a child in a wheelchair.
    - Use bright, contrasting colors to stimulate visual awareness.
    - Select symbols that reflect the child's world.
3. Using alternative play strategies - alone or in combination with the above:
    - Modify the rules of the game.
    - Use fewer game pieces - (e.g., fewer cards when playing Uno).
    - Simplify directions; use multi-sensory cues.

OVERVIEW OF COMPUTERS AND ADAPTED COMPUTER ACCESS

The use of computers offers tremendous opportunities for the child to actively participate in new learning experiences related to literacy as well as to other areas such as:

1. Looking at books

2. Reading books

3. Drawing

4. Writing
5. Communicating about print materials and activities
6. Cooperative learning
7. Manipulative play (simulated)

Appropriate programs may provide:
- excellent graphics
- interesting sound effects
- music
- speech output
- interesting responses to student actions
- endless repetition
- delightful and sometimes unexpected animations
- active rather than passive learning opportunities for turn-taking and working in pairs

Computer access is available for all children through standard or adapted input methods, which include, but are not limited to:
- Standard keyboard / mouse
- Commercial keyboards for children
- Low tech keyboard modifications (flap switch, keyguards)
- Adapted mice
- Switch access / scanning technologies (Ke:nx, Discover Switch, Adaptive Firmware Card, Click It!)
- Touch Screen technology
- Alternative keyboards (e.g., IntelliKeys, Power Pad, Unicorn Board)
- Speech / sound capability

THE HIGH TECHNOLOGY / LOW TECHNOLOGY CONTINUUM

Assistive technology products are often considered to be either high or low technology based on their characteristics. *Low or light technology* items are those that have few, if any, moving parts – they are typically simple and uncomplicated. Typically, no batteries or electric current is necessary for these types of items. Low technology modifications can usually be accomplished quickly, easily, and inexpensively, using materials that are readily available in the setting or in the community. *High technology* items are more complex, in either components or design. Modifications require greater time, expertise, and/or expense. Typically, electronic or electrical modifications are required. Operating these devices may require special training. They are frequently available only through commercial vendors.

P
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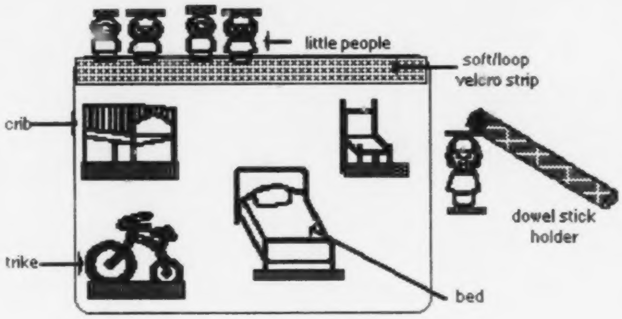
Y

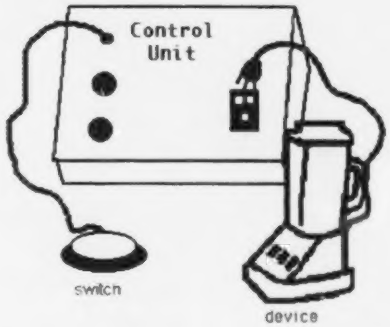
Light/Low Tech

A *playboard* can be used for early play, e.g., FisherPrice™ items can be attached with velcro® to a play mat made of indoor/outdoor carpet, to hold the items in place. The child can pick up "people" using a Dowel stick plus velcro attachment.


little people
soft/loop velcro strip
crib
dowel stick holder
trike
bed

High Tech

A *control unit* can be used to help students activate electric devices such as electric scissors or LiteBrite™. The child presses an adaptive switch plugged into the control unit to make the toy or device turn on.


Control Unit
switch
device

C
O
M
P
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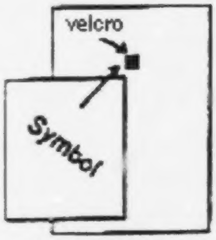
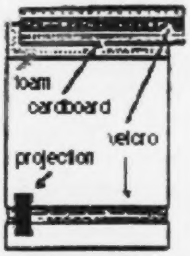
R

Light/Low Tech

Cardboard *flap switches* can be used to activate two keys in the computer keyboard. Each flap switch has a small "button" that presses down the target key, e.g., one flap switch presses <down arrow> and the other presses <return> for the program Print Shop.


velcro
Symbol

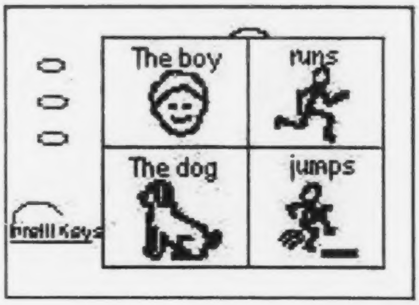
Flap Switch: Top View


foam
cardboard
velcro
projection

Flap Switch: Bottom View

High Tech

Child can use an alternate keyboard with enlarged buttons, instead of using the regular keyboard. Pictures can be used on the expanded keyboard to make it easier for the child to know what to choose. Verbal feedback (e.g., "go up") can be given for each selection.


The boy
runs
The dog
jumps

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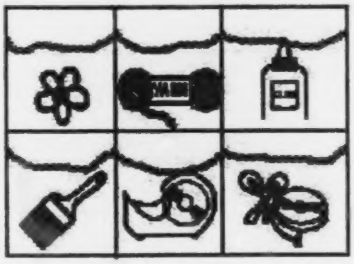
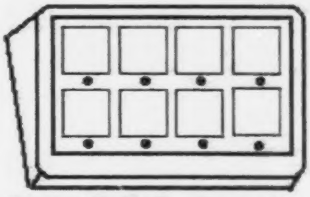
Light/Low Tech	High Tech
A Art materials (e.g., lace, pompoms, A ribbon) are placed in a *pocket display*. C The student points or eye gazes to make a choice.	The pocket display described on the left is placed on a *voice output display* on which speech can be recorded. Now the child presses the object and the label (e.g., ribbon) is spoken aloud.



Vinyl Pockets + Objects



Cheap Talk 8: Scanning

"High tech" devices and materials are not a "cure-all". They will not meet all of a child's needs – for example, they do not work well in the bathtub! There will be many situations in which "light tech" approaches are better, such as using a communication notebook, using eye gaze to make choices, or using simple homemade materials to help with page-turning. A combination of light tech and high tech materials, plus simple, practical ways for using those materials throughout the day, will help achieve the highest possible level for success.

CASE STUDIES

The following case studies, A Day at School and A Day at Home, provide examples of how assistive technology can be used during daily activities with children.

A Day At School

Ms. Showaler's preschool class includes 16 students. Seven of the children have disabilities, including speech and language delays, developmental delays, severe physical impairment, and Down Syndrome. The staff includes one teacher and two paraprofessionals. The speech-language pathologist works in the classroom two mornings per week and the occupational therapist spends one morning per month in the classroom. The classroom is set-up with various centers such as blocks, dramatic play, and the sensory table. During center-time, children move from one center to another and can pick when and if they visit each center. Each morning includes two large group "circles" which typically consist of activities involving stories and music. The children play outdoors most mornings. Observations of the children playing and learning will show how technology can be used in the classroom.

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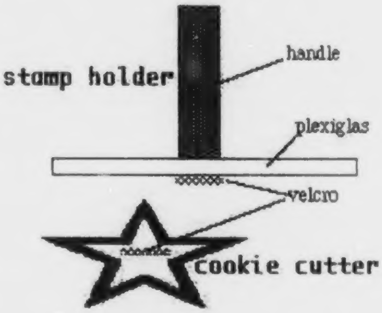
OPENING CIRCLE: The greeting song tells who came to school that day. Children take turns taking their photos and placing them on the school picture as the group sings "If your name is Katie, put your picture on the school". Next Miss Olsson, the paraprofessional, reads a story called "Dirty Duds". In front of her is a simple voice output device with one message. Children take turns pressing it to "read" the repeated line in the story "WISHY WASHY WISHY WASHY , WASH WASH WASH". Next is Show and Tell, with two students chosen each day. Ramon shows his new Phoenix Suns shirt and tells them his big brother got it for him. Marcus shows his new talking storybook. The students take turns making it "talk". The teacher now tells the students about the centers they may visit today and shows an item from each center to help them know what to expect. Children get to choose centers from a picture board and put their own nametag picture beside each center that they will visit.

SNACK: Children are using cookie cutters to make gingerbread people. Yolanda and Kim use the stamp holder to hold the cookie cutter making it easier to grasp. The Stamp Holder has a handle and a base with velcro®, so that the cookie cutter can be attached.



DRAMATIC PLAY: The dramatic play center is set-up for the next two weeks as a pretend washing center as a companion activity for the story "Dirty Duds". Boxes have been turned into a washer and a dryer. Four children are having fun undressing a large doll and putting her clothes in the washer than chanting "Wishy washy wishy washy, wash wash wash". A voice output device is sitting next to the washer so that the children can use it to say things such as: "UH-OH!" "DIRTY PANTS!" "PUT IN … PANTS" "IN … WASHER" "WISHY-WASHY", etc.

ART CENTER: Today students are using Twirl-O-Paint™ to make paper-clothing items look dirty to follow-up with the story "Dirty Duds". Katie, who has poor use of her hands, uses her eyes to help her point. Her friend, Ramon, holds up the pants and the shirt, and asks Katie which one she wants to paint. Katie looks at the shirt, so he puts it on the Twirl-O-Paint™. Then he holds up two colors of paint and Katie chooses the red one by looking at it. Mrs. Roberts, the paraprofessional, then holds up a choice board with the numbers 1 to 5 attached by velcro®. Katie looks at the number "4" and Mrs. Roberts asks "Four drops of paint, Katie?". Katie smiles to indicate "yes" and Ramon helps Mrs. Roberts squeeze out four drops of red paint. Now Katie uses the bright purple jellybean switch to turn on the Twirl-O-Paint™ and color the shirt with red swirls.

WATER PLAY: The water table is set-up with many fun pouring items, plus a variety of boats and plastic ducks. A 16-symbol picture board is attached to the water table (it has been laminated two times to keep out the water). Ms. Showaler models the use of the symbols for Juan, who is nonspeaking but does not use the symbols by himself yet. She uses a small flashlight attached to a cord around her neck to highlight symbols as she comments on what Juan is doing. She highlights symbols such as "POUR" and "MORE … WATER". Juan watches carefully but does not point to any of the symbols himself and Ms. Showaler does not force him to point.

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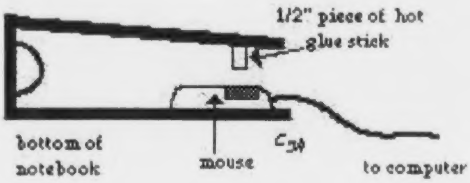
COMPUTER: The speech-language pathologist, Ms. Schwandes, has drawn a large pair of pants, a shirt, and some shoes with a computer art program. The students take turns using the "tools" on the screen (paints, crayons, stamps, etc) to color and decorate the clothing items. For Katie, Ms. Schwandes brings out a special adaptation to help her push down the mouse click so that Katie can make stamps or choose colors like her friends. Ms. Schwandes talks about what the children are doing and expands their speech attempts. Each time a new group comes, she saves the old picture and starts over.

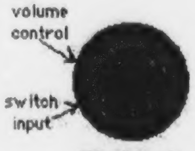


A Day At Home

Katie is a three-year-old girl with cerebral palsy who attends Ms. Showaler's preschool class. She has several types of assistive technology that her, her family, and her caregivers use with her at home and in therapy sessions. Today is her birthday – observations of her birthday with show how technology can be used at home.

COOKING: Katie helps her mom, Mrs. Logan, make a birthday cake. A jelly bean switch is attached to a small battery-operated mixer. Katie pushes the switch to activate the mixer to mix the ingredients for the cake. Once the cake is finished Katie's mom holds up a choice board with symbols for the colors pink, yellow, blue and green attached with velcro®. Mrs. Logan asks: "What color icing do you want for your cake?" Katie looks at the picture symbol "pink". Mrs. Logan asks: "You want pink icing?" while removing the picture symbol "pink" and showing it to Katie. She smiles to indicate "yes". Katie then helps her mom by pushing her jelly bean switch to activate the mixer to make icing for her cake.

SPEECH THERAPY: Ms. Lawble, the speech-language pathologist, reads a story with Katie called "Forgetful's Secret". She has recorded the message "READ SOME MORE " onto a BigMack. As they read the story, Ms. Lawble pauses after reading the page to wait for Katie to activate the Big Mack to request more of the story. A picture symbol representing "READ SOME MORE" is attached to the top of the BigMack so that Katie can begin to make an association between pictures and the words they represent.



Big Mack

MEALTIME: After eating dinner, Katie's family sings Happy Birthday. The jellybean switch is attached to a small battery-operated fan. Katie pushes the switch and uses the fan to blow out the candles on her cake. After eating cake, she opens her presents. The jellybean switch is attached to a pair of battery-operated scissors. She uses these with the help of her brother, Jesse, to unwrap the paper and open her gifts. The message "THANK-YOU FOR THE PRESENT" is recorded onto the BigMack by her big sister, Allie. Katie activates the BigMack after she opens each present, to thank her family members for her presents.

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BATHIME/BEDTIME: Mrs. Logan is giving Katie a bath. A 16-symbol picture board is attached to the side of the bathtub. Mrs. Logan models the use of the symbols for Katie but does not require her to eye gaze to "point to" the pictures. Mrs. Logan points to symbols such as "WASH", "MORE…SOAP", and "UH-OH". After bathtime, Mrs. Logan puts lotion on Katie. Mrs. Logan has picture symbols of different body parts on a choice board. Katie looks at the picture of "legs" to indicate she wants her mom to put lotion on her leg. Katie and her mom follow this routine for several turns as Katie eye gazes to the picture of a body part to put lotion on. Before going to bed, Katie's mom reads the story "Forgetful's Secret". The phrase "READ SOME MORE" is recorded on the BigMack and Katie activates the device to indicate she wants her mom to read more of the story.

II.

Questions and Concerns

INTRODUCTION

This section is about communication issues that often worry parents. The answers are written from the perspective of both parent and professional.

QUESTIONS AND CONCERNS

If we use AAC, won't that keep my child from learning to talk?

Parents are often worried that using augmentative communication will keep children from developing speech. In fact, professionals such as speech-language pathologists and teachers report that using augmentative communication often helps children in their development of both speech and language skills. Many research studies support the view that using AAC will not slow a child's speech and language development and may often times speed up that growth. We need to use all aspects of communication to help our children to talk. The more avenues we give them to communciate, the more we lessen their frustrations. Talk to your speech-language pathologist if you have questions or concerns about this area.

Will this make my child look "different"?

Children have only to go as far as the closest movie theatre or mall to see video games, portable phones, remote control cars, computers, and many other pieces of technology being used. Many of the materials involved in "assistive technology" – such as adapted toys, speech output devices, and computers – are similar to those they have already seen. This reduces the feeling that children look different. Some children may need specialized equipment such as wheelchairs that are different from their friends. But remember – young children are very accepting of individual differences, if parents, teachers, and other adults do not make an issue of them. The bottom line is that if assistive technology enhances communication and the ability of the child to participate in community activities, the perception of the child will also be enhanced.

What if other students want to use the assistive technology?

The first reaction to this question is .... HOORAY! If other children are attracted to the adapted toys, speech output devices, or other assistive technology materials, this makes them more valuable to the child who needs them. It also means that the other children can "model" how to use the equipment for the child with special needs. One exception is a child's personal communciation device. The parent or teacher may want to encourage the child to "share" the device intially so that the other children can see how it works and can provide appropriate modeling of how to communicate using the device. However, children should be shown how to correctly use a device and told when they may use it. This should be done in a very structured setting. For example, during circle or sharing time, a child may allow the other students to take turns saying "HELLO" during the singing of the Hello Song using his/her new communciation device. Children will naturally want to try the device to see how it works, but it can be explained that this is how the child talks and that it is not a toy. They will usually respect this. When natural curiosity wins, the children will need to be reminded. Another exception to "sharing" technology would be any equipment that would be dangerous to the children who were not trained how to operate it. For example, Sally should not try to drive Kelly's power wheelchair, since Sally does not know how to make it work corectly.

How will I find time to use this assistive technology?

This is an ongoing process. Like anything new, it will take time. Start small and add a little bit each time until you are comfortable with it. As your comfort level grows, you will see that it is really quite easy, and you will try more and more new ways to enhance your child's skills in communication, play, and other areas, making life easier for everyone. Assistive technology does and will take time, but when you see how successful your child is, it will make it worth the effort! Ask around and see if there is an interest group or support group in your area that is interested in assistive technology. It's a great way to find out about ideas and time-saving tips.

I'm really scared of technology – help!

Most people today use technology without really thinking about the complexity. In the last week have you used a VCR? Microwave? Calculator? Assistive technology does not only exist of complex systems. Technology may be as simple as cutting and pasting pictures from magazines and using pieces of foam to separate the pages of a book. Some of the technology, such as voice output devices and computers, is more complex. However, it does not have to be learned in one sitting. Your past experiences with remote controls for televisions and video cameras will help you learn the new information that you need. You do not have to be a "techno-ace". Try to handle a little information at a time and it will become easier.

How will I ever learn all of this stuff?

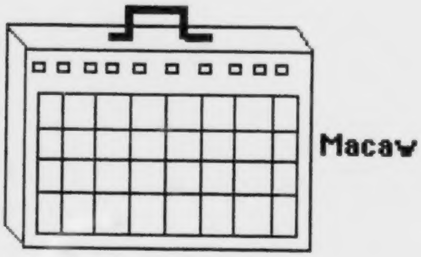
There is a great deal of information to learn. The secret is to "eat the elephant in small bites". Each person learns a bit of information and then when you are comfortable, you move on. Help can be found in the form of people (e.g., your child's teacher, speech-language pathologist and other therapists, manufactures' representatives) and resources such as those listed in the back of this book. Try to remember – there is always assistance available to help you over the bumps!

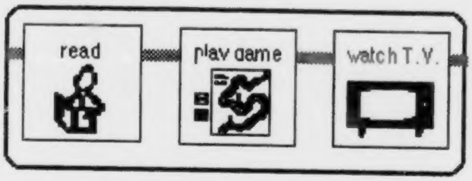
Where and when would we use assistive technology other than at school?

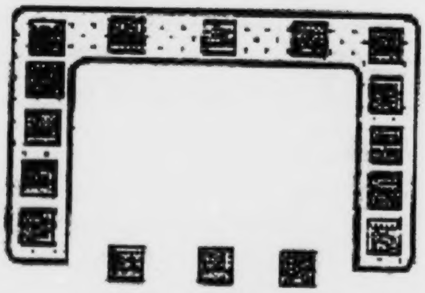
Your child will and can use assistive technology everywhere he/she communicates. This includes opportunities at home such as mealtime, playing, and family interaction. Many community opportunities exist such as participating in church, at the grocery store, on the playground, and in shopping centers. Assistive technology can be used everywhere we communicate!

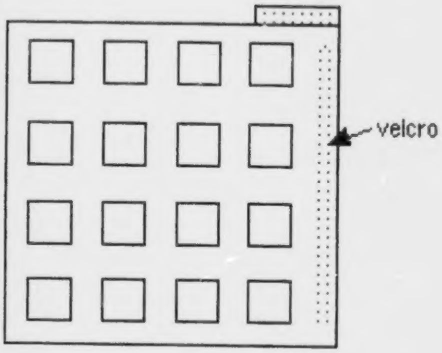
III.

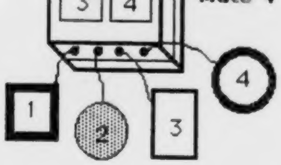
Assistive Technology In The Home or Classroom




read
play game
watch T.V.


eye point display




Switch Mate 4
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"ENGINEERING" THE HOME OR ENVIRONMENT FOR COMMUNICATION

Assistive technology offers wonderful opportunities for increasing communication and interactions. However, the unfortunate observation is that most children who have AAC systems (either paper communication displays or speech output devices) are not using those systems effectively to impact their environments, which means they are not communicating well with either peers (friends), or with adults. Parents and professionals have discovered that "engineering the environment" to provide symbol displays throughout the day can help children to become more successful augmented communicators. In a wonderful resource book, Engineering the Preschool Environment for Interactive Symbolic Communication (Goossens', Crain, & Elder, 1992), three speech-language pathologists have described ways of arranging the environment to make the most of the technology available.

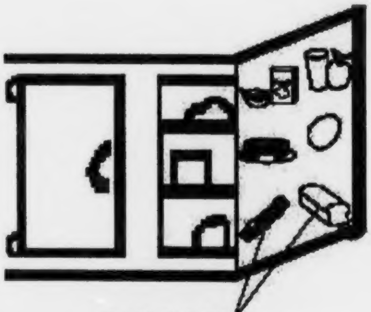
WHAT IS "ENGINEERING"?

Engineering a classroom or home environment simply means providing support materials so that the child can be a successful communicator all day long (and all night too!). For some children, this will mean having many displays available for their communication device, while other children might need mostly "light tech" or paper communication displays. A combination of types of support materials will be best for many children. In Chapter 1, "A Day At School" and "A Day At Home" gave examples for using assistive technology in the preschool classroom and in the home. The next section shows in more detail how assistive technology might be used at home and what an "engineered" home might look like.

THE "ENGINEERED" HOME

WAKING UP: Attention-Getting. Maria, a five-year-old, has a switch attached to her pillow and connected to a 30-second *loop tape on an adapted tape player*. On the tape are recorded a variety of wake-up messages (MOMMY, I'M UP! . . . YOO-HOO, I'M AWAKE . . . MOMMY, I WANT TO GET UP NOW ... GOOD MORNING, MOMMY). Before she had this, Maria used to cry and scream until Mom came in. She has learned to push the switch to call out one message, then wait a minute before calling again. Just like her little sister, Maria has also learned through experience not to wake her mom at night unless it's pretty important!

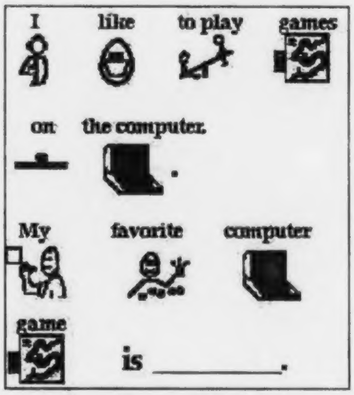
BREAKFAST: Choosing Foods. Jason, who is three and a half years old, has very definite likes and dislikes, and is beginning to feed himself. Right now, he has only three words that he uses to communicate. Jason's Mom and his eight-year-old sister Erica have "engineered" the kitchen by cutting out pictures from food boxes and the Sunday newspaper to represent many of the foods that Jason likes. They have added male (hook) stickyback velcro to the back of each picture, and have put strips of female (loop) stickyback velcro on the insides of cabinets. Now Mom, Dad, or



Symbols & Pictures on Cupboard

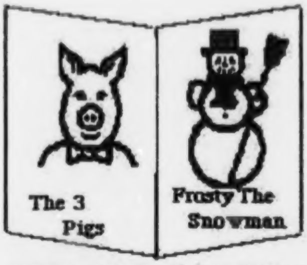
Erica can pull off a few pictures and offer them to Jason so he can choose his foods.

HOME FROM SCHOOL: Sharing Information. Marcus, age five, loves school and is very excited to share information about what happens each day. He uses several different ways to do this, including his communication device, which is a "Hawk" (from Adam Lab). Some days his teacher records a specific message, such as WE HAD A VISITOR TODAY! A FIRE FIGHTER CAME TO OUR CLASS! or a hint, such as I HAVE A SURPRISE — LOOK IN MY BAG (Marcus eye gazes to his bag, where the teacher has put a really neat art project). Once a week, Marcus's teacher sends home a message from a book called Stories About Me from the Mayer-Johnson Company. The book includes symbolized stories about many different events, such as pets, using the computer, cooking, and visiting grandparents.

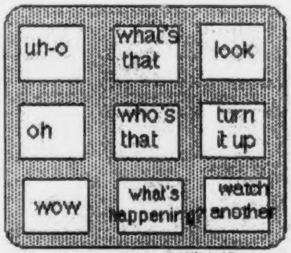


Sample: Stories About Me

VIDEO TIME: Choosing and Watching. Jessie is four years old and loves to watch videos. However, her parents would prefer that she ask them before getting a video! Her parents bought an inexpensive photo album and turned it into a video notebook. They cut out pictures from her favorite videos, using the pictures on the packaging or in advertisements. These were put into the album, one page at a time. Now Jessie can pick the video she wants and show the picture to her parents who will start the video for her. After three months, Jessie's dad decided that she needed to have a way to talk about each video. He borrowed a symbol book (Picture Communication Symbols, Mayer-Johnson Company) and photocopied symbols for comments (UH-OH! OH NO! THAT'S FUNNY! WOW!), requests (LOOK! TURN IT UP! CAN WE WATCH ANOTHER ONE?), and questions (WHAT'S HAPPENING? WHAT'S THAT? WHO'S THAT?). The pictures are arranged on a communication display, backed with cardboard, and covered with contact paper. This board is always stored in the video notebook so Jessie can find it and use it while she watches videos.



VIDEO NOTEBOOK: Choicemaking



VIDEO COMMUNICATION BOARD: Conversation

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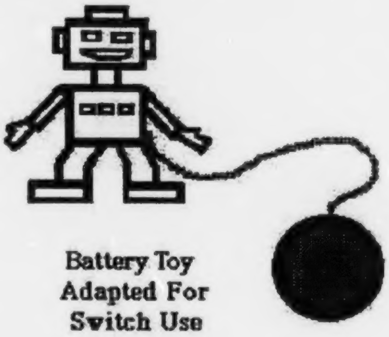
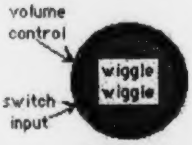
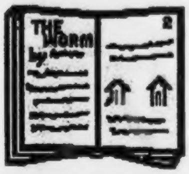
PLAY: Adapted Battery Toys. Carrie is a three-year-old who loves to play but does not have good use of her hands. Her occupational therapist helped her parents locate some battery-operated toys that have been adapted so that a switch can be used to operate them. Carrie squeals with delight when she presses a switch and makes the robot walk across the floor to her brother. Her brother tied a little drawstring bag around the robot's neck so it can carry small toys and candies back and forth. The occupational therapist recently sent plans home for modifying toys so that Carrie's parents can adapt toys less expensively.



Battery Toy Adapted For Switch Use



Big Mack



Big Mack + Storybook:
Repeated Line Recorded Into Device

BEDTIME: Story & Good Night. Like most children, four-year-old Alan loves a good bedtime story! He really likes to be a part of the story, so his family has made some modifications. Sometimes they use the "Generic Book-Reading Page" at the end of this section to let him control the book reading and be able to comment. If the book has a repeated line, they quickly record it into their "*Big Mack*" communication device (from Able Net). Many nights, they simply cuddle up with Alan and read the book, paying special attention to his eye gaze, vocalizations, and pointing to let him be a part of the reading time. When it comes time to say goodnight, Alan loves to use his "Goodnight Page". It is modeled after the story "Goodnight Moon" and lets Alan say goodnight to people and objects that he loves! Alan's "Goodnight Page" is included in the symbol pages at the end of this section.

WHAT ARE THE GOALS OF ENGINEERING?

Goossens' and her colleagues suggest that aided augmentative and alternative communication (AAC) in the preschool classroom should:

- Be used throughout the day, with many people, with the child being an active participant, to create new messages.
- Be used to make requests for actions or objects, answers, comments, negations, teasing.
- Occur in at least 80% of ongoing classroom activities (similar to the use of manual signs for hearing impaired students enrolled in total communication classrooms).
- Be used for communication with **classmates**, as well as **adults** (teachers, aides, therapists).
- Be designed and carried out as quickly and inexpensively as possible.

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These goals were described for preschool classrooms. Many of the same goals would apply to "engineering" home and community environments (e.g., going to the park, mall, movie theatre, Grandma's house). However, it may be overwhelming for parents to try to create communication displays for 80% of all activities that happen at home and in the community.

COMMUNICATION DISPLAYS FOR HOME AND COMMUNITY

Many parents feel overwhelmed at the task of creating communication displays for activities at home and in the community. Don't despair! Books are available with hundreds of pre-prepared communication displays that only have to be colored and covered with laminate or clear contact paper. In addition, computer software is available to create communication displays. If you don't find displays you need, suggestions for creating communication displays are also available. Ideas and "How-To's" are included in the chapter and in Appendix B. Remember to get help from older siblings in coloring those overlays!

AIDED LANGUAGE STIMULATION

So far, it sounds as if placing communication displays in front of the child at home and at school will be enough to help the child learn to use symbols effectively to communicate and to support their development of speech and language. Not true! As Goossens', Crain, & Elder (1992) point out, if children are going to use their aided AAC systems effectively and interactively, their communication partners (parents, teachers, classmates, therapists, etc.) must also use the children's systems to communicate with them. This is called **Aided Language Stimulation**, and is at the core of the whole approach! A definition of the training strategy is provided below:

> When conducting Aided Language Stimulation, the facilitator (parent, teacher, aide, classmate, therapist) points out key symbols on the child's communication display to accompany all verbal language stimulation that is used with that child. For example, if feeding the fish, the parent points to the HUNGRY symbol while saying "HUNGRY. That fish looks really HUNGRY". Then the parent points out GET, FISH, and FOOD, while saying "GET FOOD. We need to GET that fish some FOOD", etc.

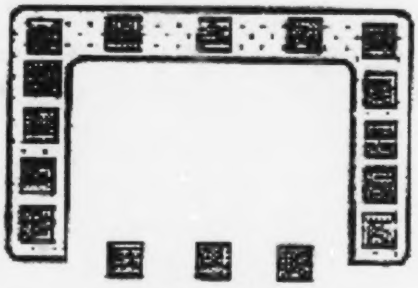
"HOW-TO'S" FOR ENGINEERING YOUR HOME

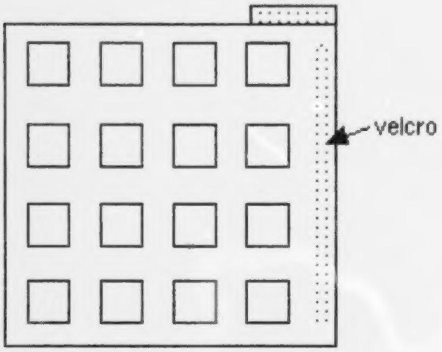
WHAT DO SYMBOL DISPLAYS LOOK LIKE?

Symbols may be displayed in a number of different ways, depending on the needs of the children and the classroom or home environment as a whole. Typically, a single student will use a range of formats, depending on factors such as: the activity, the location (indoors / outdoors), the time of day (one child may be more "tight" in the morning, another may be more tired in the afternoon, which may affect how they access). Both *light tech* and *high tech* approaches will typically be used for all students. Following are some samples of each.

LIGHT TECH FORMATS

EYE POINT DISPLAY: The format shown is the horseshoe eye point display. It is easily set up and allows the facilitator to reach the child for play, feeding, and so forth. It permits placement of 13 symbols on the horseshoe eye-point display. Supplemental symbols can be added if needed. Symbols are double-sided so that the communication partner can read the child's eye point and can also see symbols to allow quick modeling of communication. **Directions:** Goossens', Crain, & Elder, 1992, pp. 169-170.

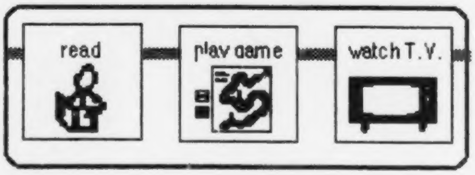

eye point display



16-LOCATION DISPLAY: This format provides 16 symbols arranged in a "floating" format so that symbols do not touch. The display is 12" x 12". It may be used as a light tech display by placing the symbols on file folder or other sturdy material. **Directions:** Goossens', Crain, & Elder, 1992, pp. 163-167.

36-LOCATION DISPLAY: This format provides 36 symbols that may be arranged on a file folder or other sturdy material and used as a light tech communication display. **Directions:** Similar to 16-Location display.

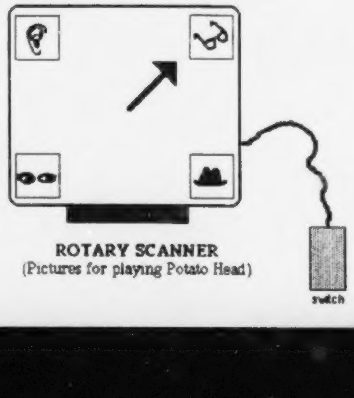
CHOICE BOARD: This format may be used with supplemental symbols for choicemaking, or with sentence-building activities such as symbol-aided music. It permits children to see symbols in connected format, using a "slot-filler" approach, with a sentence frame on the front and choices on the back. **Directions:** Musselwhite & King-DeBaun, 1996.



HIGH TECH FORMATS

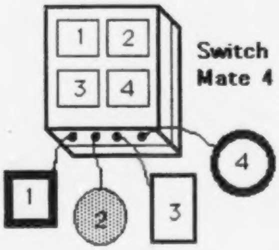
Many commercial communication devices are available, for which communication displays can be developed. A small sampling is provided below.

ROTARY SCANNER DISPLAYS: This simple device uses a circular scan pattern, with an "indicator" rotating in a clockwise direction. Scanning rate is typically adjustable. Symbols are placed around the edge of the display. The same symbol sets described for



ROTARY SCANNER
(Pictures for playing Potato Head)

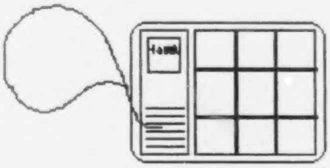
use with a horseshoe eye gaze system can be used with a rotary scanner. An inexpensive rotary scanner can be created by individuals with some electronic knowledge (See Goossens', Crain, & Elder, 1992, pp. 171-174). **Displays:** Goossens', Crain, & Elder, 1994, Book I.



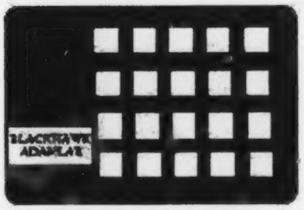
Switch Mate 4

REMOTE SWITCH: Remote switch devices have separate switches that can be plugged in so that a single child may have several choices, or a group of children can each have a switch to say one message. For these devices, symbols should be cut apart and placed on each switch to show the message. It helps if each switch has a small square of female (loop) velcro, and each picture has a square of male (hook) velcro, so that symbols can be quickly attached.

8-LOCATION OR 9-LOCATION SYMBOL DISPLAYS: Many devices can use either 8 symbols (e.g., *AlphaTalker, Macaw, DigiVox*) or 9 symbols (e.g., *Wolf*). Since this is a very small number of symbols, each symbol must be carefully selected to have the greatest possible power. **Displays:** Goossens', Crain, & Elder, 1994, Book I.



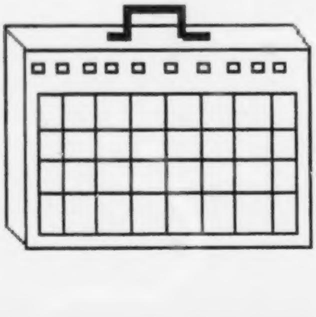
Hawk



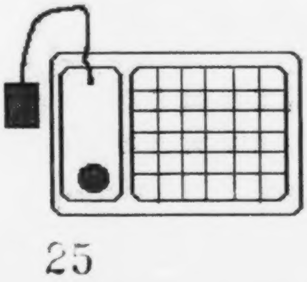
SAMPLE 16-LOCATION DEVICE

16-LOCATION DISPLAYS: The same 16-location displays described for light tech use can be placed on a *PowerPad* (Dunamis) for computer speech, using a software program such as Talking PowerPad (public domain) or used with a *Say It Simply Plus* device (Innocomp), or reduced in size to use with *Black Hawk* (AdamLab). **Displays:** Goossens', Crain, & Elder, 1994, Book I.

32-LOCATION OR 36-LOCATION DISPLAYS: The 36-Location displays described as Light Tech displays can also be used with the *PowerPad* or *Say It Simply Plus*. It may also be used with a device such as the *MegaWolf*. 32-Location displays can be used with devices such as *AlphaTalker* (Prentke Romich), *DigiVox* (Sentient), or *Macaw* (Zygo). 36-Location displays can be used with the *Wolf* (AdamLab). **Displays:** Goossens', Crain, & Elder, 1994, Book I.



Macaw



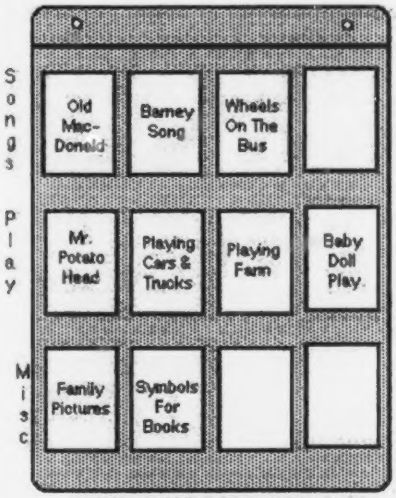
SAMPLE 36-LOCATION DEVICE

WHERE SHOULD WE STORE THOSE DISPLAYS?

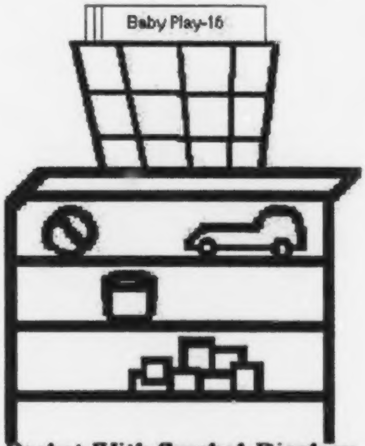
"I KNOW – IN THE FILE CABINET!" **NOT!** "IN SUSIE'S BACKPACK?" **NOT!**

"Communication displays must be stored in close proximity to where they will be needed in the classroom" (Goossens', Crain, & Elder, 1992).

This principle applies to the home as well. Goossens', Crain, and Elder (1992) suggest a number of simple ways to store materials to help partners quickly find and set up displays. Samples include affixing displays to the following surfaces: bulletin boards, back of shelving, tempo display loop fabric, indoor-outdoor carpet, and female velcro. Displays can also be placed in or on wall pockets, plastic bins, and slotted shelf brackets on walls. Supplemental symbols, song sets, etc., may be placed in shoe pocket holders or small wall dividers.



SHOE POCKET HOLDER (Holds Symbols Etc.)



Basket With Symbol Displays For Play Stored On Toy Shelves

BULLETIN BOARDS, BINS, AND BAGGIES:

At home, storage choices may differ. For example, symbols for choosing foods may be stored inside kitchen cabinets. Displays to accompany toys such as a farm set or jack-in-the-box might be stored in an expanding folder attached to the inside of the toy box. The key to successful storage is Musselwhite's infamous **30-second-rule**, which states that "If you can't set it up in 30 seconds . . . you probably won't use it!"

SAMPLE COMMUNICATION DISPLAYS

At the end of this section you will find a few sample communication displays. These are only **samples**! They may be perfect for your child, they may need modification to fit your child's device or communication skills, or they may only provide you with ideas of possible

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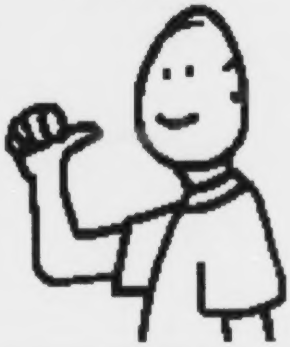
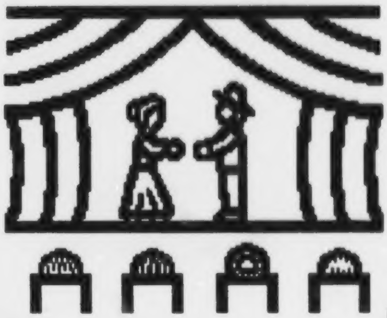
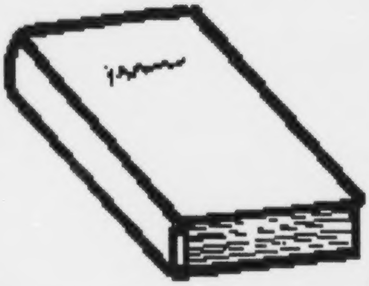
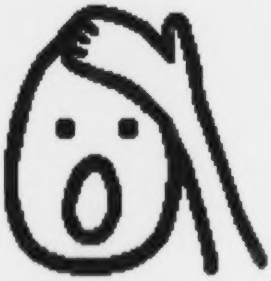
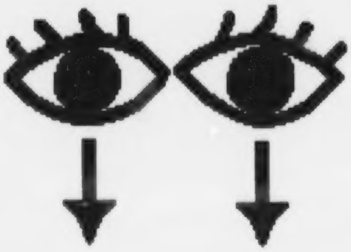
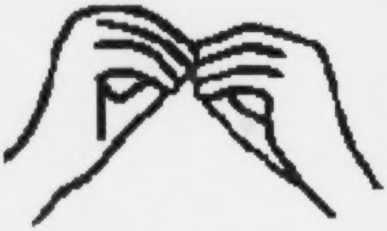
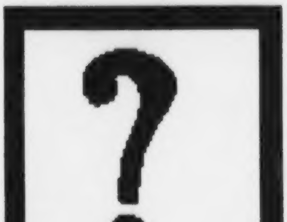
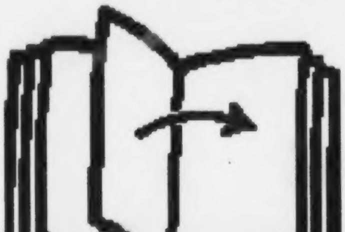
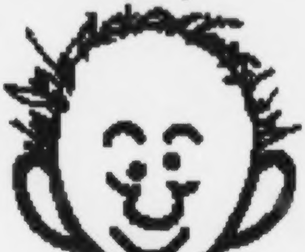
communication displays for your child. Feel free to use, modify, or ignore all of these displays. The most important issue is to support your child's communication in ways that are comfortable and enjoyable for you and your child. Refer to Appendix B for "How To's" related to engineering the home and making communication displays.

Generic Bookreading
9-Location

Let me  o	Act it out!  p	Today's book is  y
uh-oh  o	look  p	more  b
What's that?  o	Turn the page  p	silly  b

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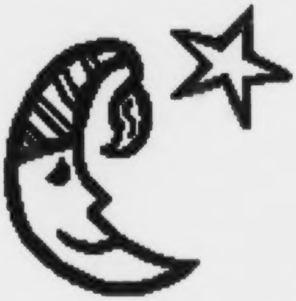
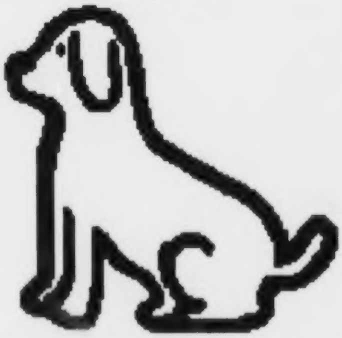
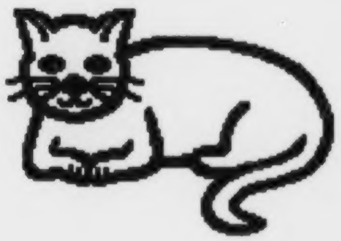
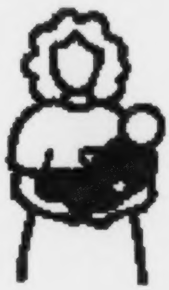
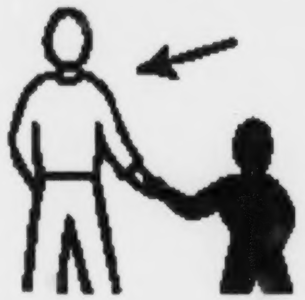
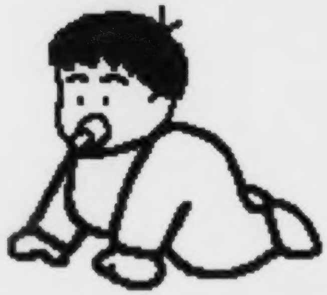
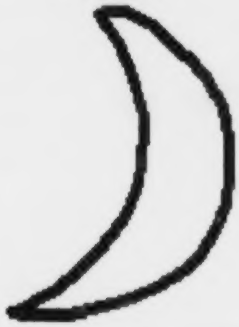
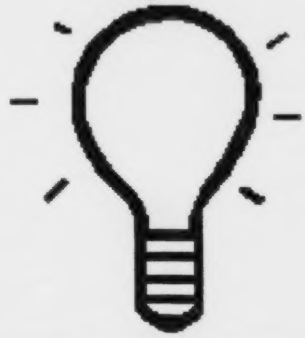
Goodnight Page
9-Location

Good night  o	Spot  y	Whiskers  y
Mommy  y	Daddy  y	Jimmy  y
stars y	moon  y	light  y

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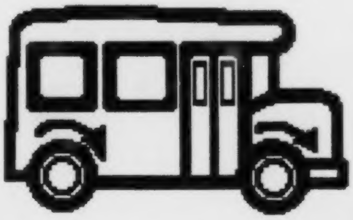
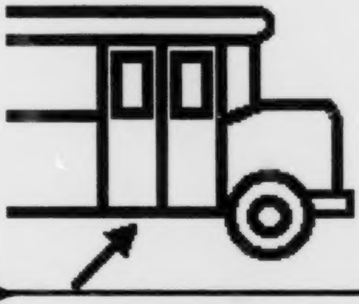
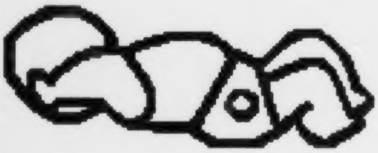
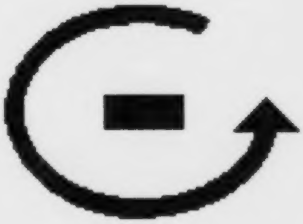
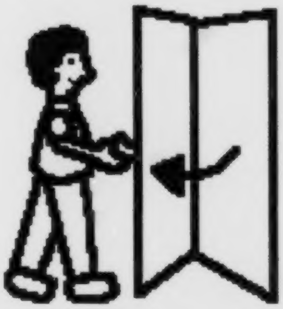
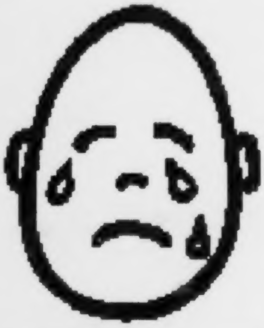
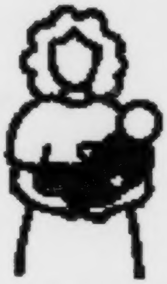
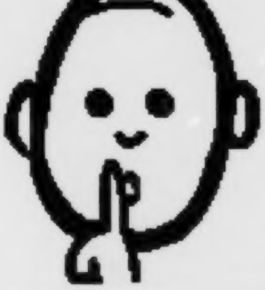
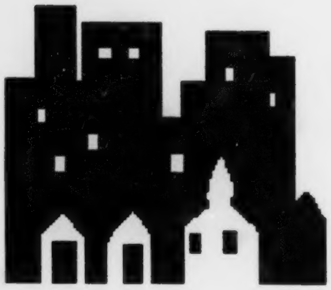
Wheels on the Bus
9-Location

The wheels on the bus go  y	The doors on the bus go  y	The babies on the bus go  y
round and round  p	open and shut  p	wah, wah, wah  p
The mothers on the bus go  y	shh, shh, shh  p	all through the town  y

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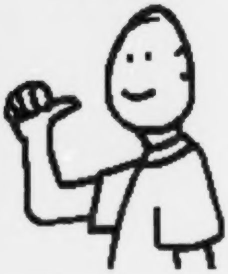
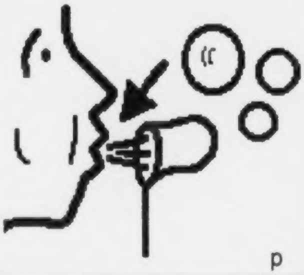
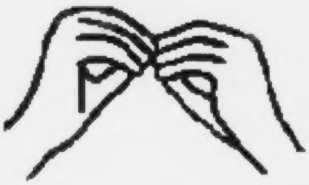
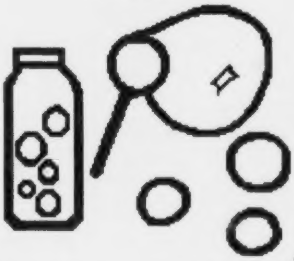
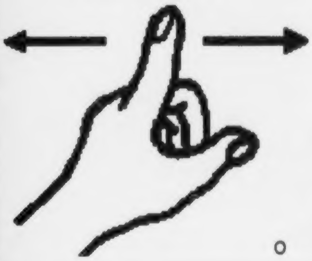
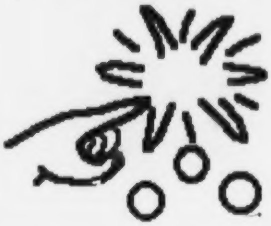
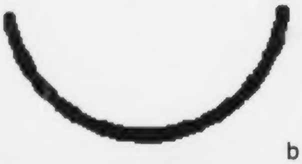
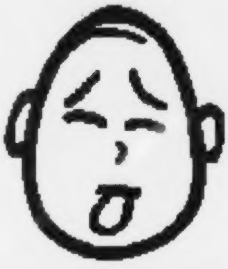
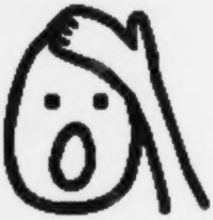
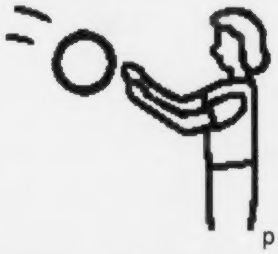
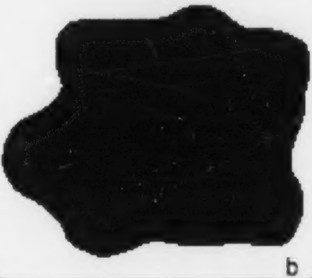
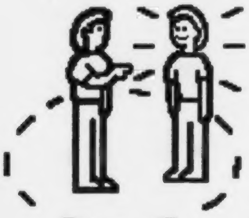
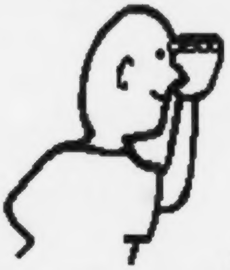
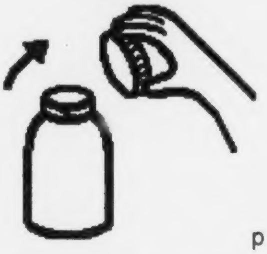
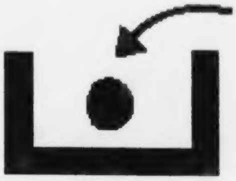
Bubbles
16-Location

Let me  o	blow  p	more  b	bubbles  y
no, don't  o	pop bubbles  p	all gone  b	Yuckie!  b
uh-oh  o	catch  p	big  b	little b
your turn  o	look  p	open  p	in  g

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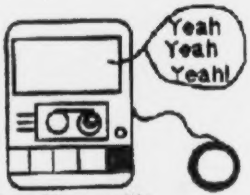
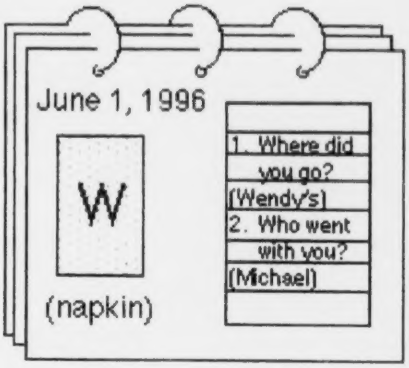
Phone (619) 550-0084 web site: www.mayer-johnson.com

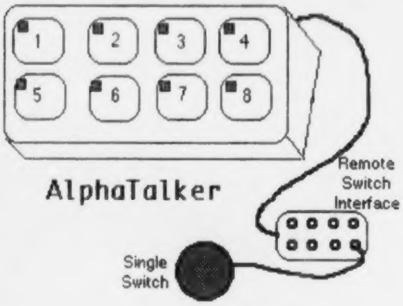
IV.

HIGH TECH / HIGH HOPES!
SPEECH OUTPUT DEVICES


Yeah
Yeah
Yeah!

Tape Player with Loop Tape + Switch


June 1, 1996
W
(napkin)
1. Where did you go?
(Wendy's)
2. Who went with you?
(Michael)


1
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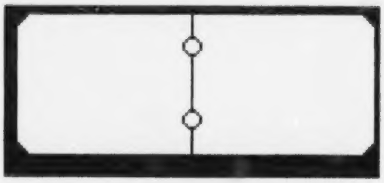
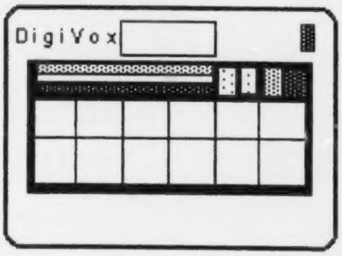
AlphaTalker
Remote Switch Interface
Single Switch



Say It



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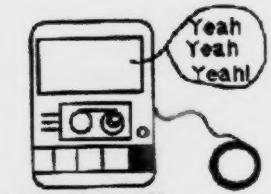
SIMPLE HIGH TECH

Did you know that there are devices that you can buy at your local department or electronics store? In fact, if you own a battery operated tape recorder, you may be able to adapt it to help your child's communication! This section will cover "off-the-shelf" devices that you can use or adapt in simple ways to support your child's communication.

USING TAPE PLAYERS AND "LOOP TAPES"

Simple messages can be recorded on a continuous loop tape, then played using an adaptive switch attached to a tape player. The loop tape used is an outgoing message loop tape, found in the phone answering machine section of an electronics store such as Radio Shack. The "How To" at the end of this section provides specific steps for adapting a tape player, recording a message, and adding a switch.



Tape Player with Loop Tape + Switch

FINDING "MESSAGE MAKERS" AT THE MALL

In this electronic age, many message giving devices are available at a variety of stores. These are for purposes such as: saving a friend's phone number on a keychain; saving a message in the car to remind you to do something when you get home; sending a message to grandparents on a picture frame or card; and saving a message in the kitchen, when you don't have time to interrupt cooking. These simple message machines can be great for people who need AAC, either as an introduction or as an extra communication system.

How To Choose A Simple Message Giving Device

These devices differ in many important ways! For example, one family bought a message giving device for under $20, only to find that the batteries had to be replaced once a month, costing more than $8 each time. Other devices may be disappointing because of the low volume or poor voice quality, making it difficult to understand. Below are a few features to consider if you are looking at message giving devices. These features have been used to consider several commonly-found devices in the chart at the end of this section.

Size. Is it small enough to carry? Large enough not to get lost among the toys?

Voice Quality. Is it easy to understand? For example, we found that the *Yak Bak* was fun as a toy and the *Talking Key Chain* was good for saving your own messages. However, neither one was clear enough to serve as a communication device.

Loudness. Is it loud enough to be heard at home? In a small group? At a fast food restaurant? At Circle Time?

Mounting. If necessary, can it be worn on a belt? Worn on the wrist? Easily attached to a table top or laptray? For example, the *Auto Minder* has a clip that permits it to be worn on the belt. If that is removed, it has a flat surface, allowing it to be attached to a laptray with velcro.

Latching. If you press the "play" button, is the entire message played? For example, with a loop tape + tape player, the user has to hold down the switch for the entire message. This can be annoying, or even impossible for some individuals. The switch-adapted Talking Card from Hallmark also requires the person to hold down the switch for the entire message. Two options are to use an "on/off" switch (e.g., Plate Switch With Latch, Toys For Special Children), or to add a "switch latch" (e.g., Toys For Special Children, AbleNet) to your existing switch to make it an on/off switch. Now the child presses the switch to start the message, and presses it again when the message is done.

Lock In Message. Can the user accidentally "record over" a message? Some devices have "lock-in" buttons (ex: *Auto Minder*), or tiny recessed "record" buttons (ex: *Voice Recording Photo Frame*) to avoid this.

Size of "Play" Button. Is it small (less than one inch, like the *Sounds By Me*)? If you adapt it, can you make the play button large (ex: add hot glue to *Voice Recording Photo Frame* to make the entire top of the frame the button)?

Batteries. How many? What type? Will they be hard to find? Expensive? For example, both the *Auto Minder* and the *Sounds By Me* use four AAA batteries, which makes upkeep simple and cheap.

Pictures. Is it easy to add pictures, symbols, or other graphics to show what the message is? For example, if you adapt the *Voice Print* or the *Voice Photo Frame*, they offer a large surface for adding pictures. The *Sounds By Me* has a message strip that can be used for adding words or pictures.

Message Length. Less than two seconds per message cell (*Sounds By Me*)? Ten seconds? Twenty seconds? More? The importance of this depends on how you plan to use it.

Switch Adaptation. If necessary, can it be adapted for switch use? For example, Creative Communicating offers plans for adapting the *Talking Hallmark Card* for $3. A battery interrupter can be used to adapt the *Auto Minder*. Simple adaptations using hot glue sticks can make the *Voice Photo Frame* and the *Voice Print Picture Frame* seem like its own switch!

Miscellaneous. Is it attractive? Durable? For example, those made of metal (*Voice Photo Frame*) or hard plastic (*Auto Minder, Sounds By Me*) are more durable than those made of paper (*Talking Card, Voice Print Picture Frame*).

USING SINGLE MESSAGE DEVICES INTERACTIVELY

Beginning Communication: Exploring Speech Output

Many simple devices are available that offer one or two messages. Examples include many of the "off-the-shelf" message-giving devices, such as the *Auto Minder, Talking Card, Voice Recording Photo Frame*, and *Voice Print Picture Frame*. Several excellent devices are commercially available that offer additional features. For example, the *Big Mack* (AbleNet) also includes features such as high durability, auditory feedback to show when the device has been activated, location for mounting screws, jack for remote switch, cable for activating battery toy or device, volume control, on/off switch, and jack for external speakers.

These single message devices are often under-used. Several brief case examples show how two children with differing needs might integrate this simple technology into their lives. Resources and references are listed in the Appendices at the end of this manual.

Maria

Maria is a four-year-old girl who lives at home with her mom, a little sister, her aunt, and her cat Leigh-Leigh. Maria attends a preschool class for students with and without disabilities four mornings a week. She enjoys school and especially loves music. Maria's learning is challenged by the effects of spastic-athetoid cerebral palsy. She uses a wheelchair to move around. Her speech is unintelligible to everyone except her mom, who understands occasional words. Maria is scheduled for an augmentative communication evaluation in two months. In the meantime, her mom and speech-language pathologist have set her up with an on/off switch, the Plate Switch with Latch (Toys For Special Children) connected to a 30-second loop tape on an adapted tape player. They chose an on/off switch because Maria was having difficulty holding down a switch to activate the message. Now she presses the switch to speak a message, then presses it again when the message is completed. Here are a few of the times Maria uses speech output each day.

WAKING UP: Attention-Getting. At night, Maria's Plate Switch is velcroed to her night table, with the tape player attached. On the tape are recorded a variety of wake-up messages (MOMMY, I'M UP! ... YOO-HOO, I'M AWAKE ... MOMMY, I WANT TO GET UP NOW ... GOOD MORNING, MOMMY). Before she had this, Maria used to cry and scream until her mom came in. She has learned to push the switch to call out one message, then wait a minute before calling again. Just like her little sister, Maria has also learned through experience not to wake up her mom at night unless it's pretty important!

BREAKFAST: Requesting More. After several trials, Maria's mom helped her little sister record MORE PLEASE on a tape, and Maria uses her switch to control the message. That way, she can control the speed with which her mom or aunt feeds her breakfast.

ART: Attention-Getting. Maria's class is making styrofoam/pipe cleaner spiders. When another teacher comes in the room, she presses her switch (attached to a loop tape) to say HEY LOOK! WE'RE MAKING FUNNY SPIDERS!

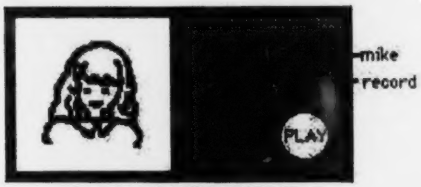
SCHOOL: Music. Maria really enjoys music, but it was getting expensive to record the refrains from all the songs Maria likes on different loop tapes, and took too much time to re-record the loop tapes. Maria's speech-language pathologist got her a *Voice Print Picture Frame* (Wal Mart) to try out. Now the aide can quickly record the refrain or repeated line from each song, such as: Old MacDonald – "E I E I O", Where Is Thumbkin "RUN AWAY RUN AWAY", and Five Little Ducks – "QUACK QUACK QUACK". The aide also takes a picture from a shoe pocket holder in the music center to show which song is recorded. For example, when it is time to sing Wheels On The Bus, she attaches a picture of a town with the words "All through the town" to the piece of velcro on the top of the *Voice Print Picture Frame*. When it is time for her part, Maria presses the top of the *Voice Print* to sing the refrain. RESOURCE: Songbook and Symbol Songbook by Caroline Musselwhite.

MEALTIME: Saying Grace. At Maria's house, each child takes a turn to say the grace. When it is Maria's turn, her aunt gets the loop tape marked "Grace" and puts it in the tape player. Maria uses her switch to lead her family in the grace.

AFTER DINNER: Feeding the Cat. Maria's favorite time of day is feeding Leigh-Leigh. Maria's mom is trying to teach her little sister to help operate her loop tape system. Her little sister Veronica holds up two loop tapes, one with a picture of a story book, and one with a picture of a kitty. Maria vocalizes and reaches toward the loop tape with the kitty picture. Her mom helps Veronica to put it in the tape player. Then Veronica opens the door, they turn up the volume on the tape player, and Maria presses her switch to call "HERE KITTY, KITTY, KITTY, KITTY ... HERE LEIGH-LEIGH ... COME GET DINNER ... KITTY, KITTY, KITTY, KITTY."

Brian

Brian is a four-year-old boy enrolled in a preschool for children with and without special needs. He lives at home with his parents, grandmother, three siblings, and two dogs! Brian enjoys school and his friends there. He also enjoys roughhousing with his brothers and dogs. Brian is very delayed in all areas of development. He now walks without assistance, although he occasionally stumbles. He is just beginning to talk, and communicates mostly in single words. He receives speech-language therapy and occupational therpy in his classroom, using an integrated model. His school has several single-message or double-message devices, which they are trying with Brian, to see which one works best for him. They have loaned Brian's family the *Voice Recording Picture Frame* for two weeks, to see how it works at home. Below are some samples of how Brian uses several different devices throughout one day.



Voice RecordingPhoto Frame
(Radio Shack)

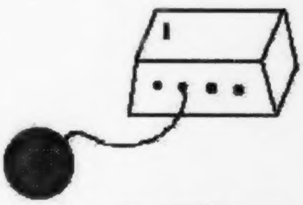
SCHOOL: Sharing Time. Brian uses the the *Voice Recording Picture Frame* (Radio Shack) for many events during the day. When it comes time for sharing, the aide whispers in his ear to prompt him to take a turn. He then presses his device to say I HAVE A SURPRISE – LOOK IN MY BAG, then points to his bag, where Mom has hidden a new battery-powered toy. VARIATION: Specific messages can also be shared (MY DOG RAN AWAY – BUT HE CAME BACK!) RESOURCE: Total Augmentative Communication by Linda Burkhart.

SCHOOL: Music. Brian likes music, so his aide quickly records the "refrains" or repeated lines from songs into the *Talking Card* (Hallmark). The aide takes a picture from a show pocket holder in the music center to show which song is recorded. Since Brian has no problem using his hands for most activities, he simply opens up the *Talking Card* when it is time to sing his line. This does not seem to be as successful as the *Voice Recording Photo Frame*, as Brian keeps opening and shutting the card, even when it is not time to communicate. Also, his occupational therapist questions whether the *Talking Card* will be durable enough for Brian. RESOURCE: Songbook and Symbol Songbook by Caroline Musselwhite.

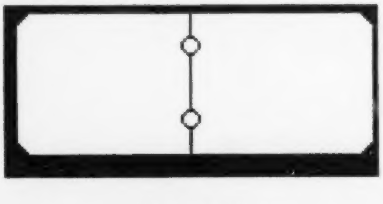
STORYBOOK READING: Repeated Lines. Brian uses his *Voice Recording Photo Frame* to say the repeated lines in his favorite stories at school and at home. Samples are: "Me Too", "Just For You", and "All By Myself" by Mercer Meyer, classics such as "Three Little Pigs" and "Gingerbread Man", and Dr. Seuss books such as "Cat In The Hat." He needs considerable prompting to activate the device at the right time, but will ususally stay for the story session for five minutes before he wants to leave.

SCHOOL: Deliver Messages. Brian's teacher just ran out of paint. She quickly programs a message into the *Auto Minder* (Allied Voice Tech) and sends him next door with the aide to say MRS. JONES NEEDS SOME PURPLE PAINT, DO YOU HAVE ANY THAT SHE COULD BORROW? RESOURCE: Total Augmentative Communication by Linda Burkhart.

PRETEND PLAY: Switches for Sound Effects. Thin "notebook" switches can be placed directly in the play environment so that childen can produce sound effects while they play. For example, Brian is playing with the Cabbage Patch doll. When he presses her bonnet, she cries; pressing her bib yields slurping sounds; patting her back produces a burp, and touching her diaper results in !!! The four hidden switches are attached to the remote-switch device, *Cheap Talk 4 Switch Module* (Toys For Special Children). VARIATION: Other remove switch devices could also be used, such as *Action Voice, SpeakEasy, SwitchMate* or *Voice Pal +*. Other sound effects could also be made: In the kitchen, stove = smoke alarm, buzzer; phone = ringing; sink = water running, etc. RESOURCE: Engineering the Classroom by Goossens', Crain, and Elder; More Homemade Switches by Linda Burkhart.

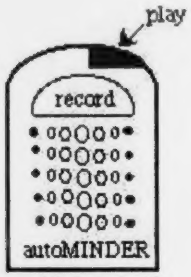

Cheap Talk 4 Remote Switch Module (Enabling Devices)

SCHOOL: Snack. Brian is beginning to make choices, and his teacher would like him to be able to make them verbally, as well as by pointing to objects. The class has a *Say It* (Toys For Special Children) which has two symbols


Say It

added for snack time. The pictures are velcroed to the wall near the snack table, so they will always be available. On one side of the *Say It* is recorded "CRACKER ... I'D LIKE A CRACKER PLEASE", and on the other side it says "DRINK ... COULD I PLEASE HAVE A DRINK?" Brian gets to choose which one he wants next, and when he wants it. After several weeks, they note that this has really cut down on his grabbing behavior, especially grabbing food or drink from other students.

BABYSITTERS: Message Giving. Brian uses his *Voice Recording Photo Frame* (Radio Shack) to share a message from preschool "GUESS WHAT – WE MADE FUNNY SPIDERS TODAY. MINE IS HIDING IN MY BACKPACK." When he gets home, he will share the same message with his family.



AUTO MINDER

COMMUNITY: Taco Bell. Brian's mom is stopping by Taco Bell on the way home from the babysitter. Brian liked the look of the *Auto Minder* (Allied Voice Tech) and cried when his teacher tried to put it away at the end of the day. His babysitter suggested that it looks like the pager his teenage brother wears, and his teacher agreed to let him try it out overnight. His older brother programmed their order into the *Auto Minder* while they were driving to Taco Bell. Brian walks into Taco Bell with the device attached to his belt. When it is his turn, he presses the <play> button to say "WE'D LIKE THREE SOFT CHICKEN TACOS, TWO BURRITOS SUPREME, TWO MEDIUM PEPSIS AND ONE DIET PEPSI ... THANKS!"

HOME: Reading Books. Brian's grandma lives with them, and wants him to read some stories with her. Brian's mom bought a few of the stories they read at school, and Grandma encourages him to use his *Voice Recording Photo Frame* (Radio Shack) to say the repeated lines, such as "NOT BY THE HAIR OF MY CHINNY CHIN CHIN!" when Grandma reads "The Three Little Pigs." He does not seem to anticipate when he should push the switch to play the message, but he does enjoy saying the messages, especially when his brother records it with great sound effects. When Grandma records it without much intonation, he loses interest quickly. RESOURCE: Emergent Literacy Success by Caroline Musselwhite & Pati King-DeBaun.

HIGHER TECH SPEECH OUTPUT DEVICES

Of cource, many preschoolers need to have devices that offer them far more than one message at a time. A number of such devices are summarized in Appendix C: Introductory Voice Output Devices. They can be used at school, at home, in the community – anywhere that children need to communicate.

SELECTING AN AAC DEVICE

Each year, more commercial devices are developed to serve the needs of persons who use alternative or augmentative communication (AAC). These devices are often very complex, offering many different features. If it is so difficult to choose a good device for single messages, think how much more difficult it is to select a device to meet more extensive needs!

The Team Approach

Using a team of professionals, family members, and caregivers will ensure that a decision will be made that is based on expertise in areas such as motor skills assessment and AAC device features, plus expertise on the needs, interests, and abilities of the student and his or her family. Sample team members for preschoolers and early primary students include: parent(s) and other caregivers (e.g., grandparents who live in the home), regular education and special education teachers, speech-language pathologist, occupational therapist, and physical therapist. Community-based therapists should be included, if applicable, to increase the input and carryover. Some children may not need all of these team members — for example, a child without physical impairments may not need the services of occupational or physical therapists. In other cases, additional team members may be necessary, such as adding a vision specialist for a child with visual impairment.

Ideally, the team should see the child at his or her school or home, rather than in an unfamiliar setting such as a hospital. All team members should have input through reports, checklists, or questionnaires. Each team member should see the student directly, and assessment should be through interactive, functional activities. For example, a young child who loves Cinderella might use several devices while participating in activities related to that topic, such as reading a Cinderella book, playing dress-up, and making a Cinderella necklace. The team should then meet to give input on the most appropriate devices for the individual, eventually narrowing down the choice to one device.

The Feature Match Approach

AAC assessment teams typically first determine the child's needs and abilities, then match those to features of various devices to find the device that is the best "fit" for the student. It is helpful for families to have an overall knowledge of the types of devices available. However, it is very important that families and other team members not come to the assessment with a decision already made about which device they want. Rather, the device should be fit to the student, not the other way around.

Five major categories of device features have been identified (Kraat, 1985; Musselwhite & St Louis, 1988). These are:

Transmission Techniques for Indicating Message Elements. This refers to the user's means of indicating, or accessing the AAC device. For example, one child might eye point to symbols, another might use a light pointer, a third might point with a fist, and a fourth might use a finger to press a message cell on a device. Each of these is a form of direct selection. Another sub-category is scanning, in which the person uses one or more switches to scan through various choices until the desired choice is reached. This is typically used for persons with more severe physical impairments, which make direct selection difficult or impossible. Positioning of the student is also an important part in determining the transmission technique.

System Process. This refers to the communication function performed by the AAC system. For example, some devices provide only one level of messages, other devices offer multiple levels, others allow the student to link from one level to another, and still others permit encoding of messages. Other features in this category include the device memory, any "software" that comes with the system, and the general flexibility of the system (ex: number and size of message cells, types of symbols that can be used).

System Output. This simply means the way in which messages are shared using the AAC system. Samples include: visual output (symbols, letters, words), speech output (taped, synthetic or machine-made speech, and digitized or human-sounding speech), and printed output (ranging from a column of letters, to a strip printer, to a full page printer).

Portability. This refers to the location in which a user requires a device, and the ease of moving a device from one location to another. Issues of size, weight, and power supply (ex: plug-in to wall current) must be considered.

Special Considerations. This includes the entire category of "other" features, such as: cost, appearance, local customer support, and repair services.

These five feature clusters can be considered through reports, observation, and direct assessment. They will help to find the device that is the "best match" for an individual student.

INTERACTIVE USE OF AAC DEVICES

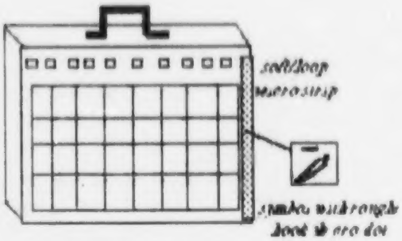
High tech AAC devices, like single message devices, should be used interactively and functionally. The use of these devices should help children be fully integrated into their classrooms, families, and community. Device use should not be forced upon children, and the importance of peer-child and adult-child interactions must always be considered. For example, the bedtime story is typically a time for cuddling and enjoying closeness between a parent and child. Therefore, this would not be the best time to introduce an AAC device, or even to offer a device, unless the child requests it.

Jason

Jason is a five-year-old boy who enjoys going to an inclusive kindergarten class five days per week. His favorite time of day is "centers", and he particularly enjoys the science center and the imaginative play center, which changes each month according to the theme. Jason lives at home with his parents. Jason has good walking skills and does not appear to have any physical impairments. However, an occupational therapy assessment showed that his fine motor skills are delayed for his age. Jason has a great deal of speech, and tests show that his receptive language skills (comprehension of the speech of others) is similar to that of his peers. However, his speech is unintelligible to most listeners, unless they know the context and can make a good guess at what he is saying. None of the other students in the class understand Jason well, which is very frustrating to him. Jason has recently received funding for an AAC device that has multiple levels for storing vocabulary. He is able to use his right index finger to press the cells for 32-location overlays. His teachers and parents attended an inservice training on how to use the device, but they are still feeling uncertain about how to integrate it into the daily routine. The AAC specialist (a therapist from the team that recommended the device) suggested that they should identify several routine events that Jason participates in frequently and enjoys, and begin to use the device for those activities. Jason continues to receive speech-language therapy in the classroom to support the development of his oral speech, but progress remains slow. This month's theme at school is zoo animals. Below are a few samples of routines that have been chosen to introduce Jason's device.

SCHOOL: Show And Tell: Jason has been embarrassed about Show and Tell because the other students often can't understand his message. His speech-language pathologist has helped him set up a "clue" overlay that helps him get the message across, while supporting his use of oral speech. It includes starters: I HAVE SOMETHING TO ... TELL / SHOW; descriptors for objects: IT'S REALLY ... BIG / LITTLE / SOFT / HARD / NEAT / SCARY / ALIVE; and places for events: IT HAPPENED ... AT HOME / AT SCHOOL / AT THE MALL / GUESS WHERE; also, people in events: MOM / DAD / GUESS WHO; and descriptors of events: IT WAS ... FUN / EXCITING / BORING. Jason also has several questions he can ask other students, such as: WHERE DID YOU GET IT? WHY DO YOU LIKE IT? WAS IT FUN / EXCITING / BORING? His speech-language pathologist used a squeeze flashlight to cue him what to say for the first few times, but now he can do it on his own.

SCHOOL: Imaginative Play Scripts. Scripts can be written for a whole range of pretend play activities such as playing doctor, house, or dress-up. This month, the play center is a zoo, complete with plastic zoo animals, blocks for building cages, paper for the zookeeper to take notes on sick animals, buckets, and pretend food. A communication display has been prepared and programmed into Jason's device. Single-word vocabulary allows him to generate sentences such as: TIME TO ... FEED ... MONKEY. UH OH! ... MONKEY ... IS ... SICK. CALL ... THE VET! RESOURCE: Sample display in Augmentative and Alternative Communication by Beukelman and Mirenda, p. 192.



Device with extra symbols added to right border

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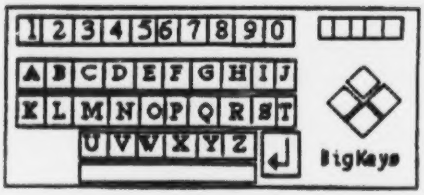
SCHOOL: Cooking Script. Interactive, useful, and fun messages can be chosen to direct and talk about this activity. Samples include: LOOK AT MINE; GIVE ME A LOT; THAT'S ENOUGH; NO, DON'T; HELP ME PLEASE; IT'S YUCKY. Jason's teacher copied the 32-location Macaw overlay for Food Preparation from the Communication Displays Book II. They used velcro to add extra symbols to the right border of the Macaw grid to represent materials used for today's cooking activity, "Larry Lion" (from The Animal Cookbook). Symbols added include: BREAD, CHEESE, CARROT SLIVERS, PEANUTS, RAISINS, LICORICE, SPREAD, and SLICE. RESOURCE: Communication Displays for Engineered Environments by Goossens', Crain, & Elder; The Animal Cookbook by Mary Buckman.

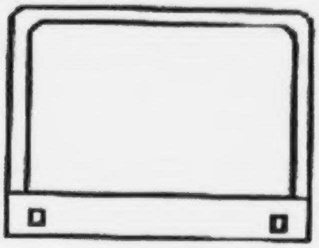
HOME: School News. Jason comes home full of news to tell his parents. Typically, they cannot understand most of his news. They have worked very hard to think of a page that will let him successfully tell about what happened at school. The page they have designed has "starters" such as: GUESS WHAT! and I HAVE NEWS ABOUT IT. It includes caategories to name activities or events: ART; COOKING; SCIENCE CENTER; STORY; MUSIC; PLAYGROUND; LUNCH, as well as specific people: MS. JACKSON (teacher); MS. ANDERSON (aide); JOSE (friend); ROBERT (friend), and general people: VISITOR; FRIEND; TEACHER. Another section helps set the tone for the news, with: IT'S REALLY ... SAD / EXCITING / SCARY / BAD, etc. Jason's parents let Jason come home and start telling them about his day. When they are having trouble understanding him (which is often for his mom, and almost always for his dad), they encourage him to try to use his Macaw to help set the topic. Often, if his parents know what and who Jason is talking about, they can pick up enough parts of the conversation to understand him.

HOME: Goodnight Routine. One of Jason's favorite books has always been "Goodnight, Moon" by Margaret Wise Brown, in which a little boy says good night to all of the items that he sees. Jason's mom designed a "goodnight" page for him, which includes all of his favorite people and toys. Eight squares were left blank on the overlay. This month, his mom adds symbols representing eight zoo animals, most of which he has in stuffed or plastic form. Jason presses two cells to say GOODNIGHT ... LION ... then presses the <speak> cell to play the message. He then repeats that orally, which his mom encourages, but does not force.

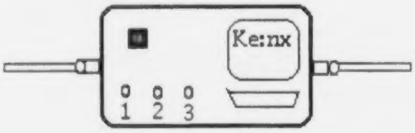
V.

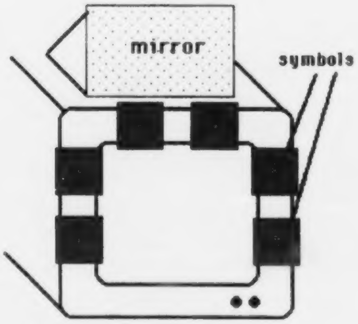
High Tech / High Hopes: Computers

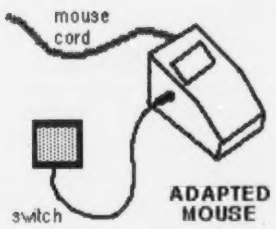

1 2 3 4 5 6 7 8 9 0
A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z
BigKeys



Touch Window




mirror
symbols


mouse cord
switch
ADAPTED MOUSE

WHY USE COMPUTERS FOR CHILDREN?

It may seem silly to use computers for children, and even sillier to use computers for children who are delayed in their development. In fact, computers are a fun, interactive way for children to learn, and are especially great for children with disabilities because they allow them to have success in a wide range of activities that would otherwise be difficult or impossible. Computers are great learning opportunities for all children because they offer:

- Excellent graphics
- Interesting sound effects
- Speech output (computerized or human-sounding)
- Interesting responses to student actions
- Endless repetition (the computer never gets bored!)
- Delightful and sometimes unexpected animations

WHAT TYPES OF COMPUTERS ARE AVAILABLE?

Many different brands of computers are out there. Three basic categories are typically used with children. These are: 1) Apple II series (especially the Apple IIe and IIgs models); 2) Macintosh Series (such as LC series, Performa models, and Power PCs); 3) IBM Compatible Series (sometimes referred to as PCs, including MS-DOS and Windows versions).

Computer models will be discussed again in the section "Buying A Computer." This very brief overview is meant to set the stage for the description of software and applications that follow.

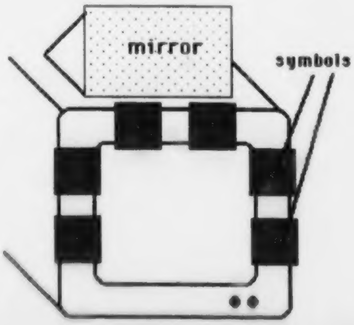
ACCESSING COMPUTERS

Just as concrete ramps allow people in wheelchairs to go from a parking lot to a sidewalk, "curb cuts" can be found for the computer, to permit all students to enjoy the fun and interactive learning opportunities available. These modifications can be either light tech (inexpensive, homemade tools) or high tech (sometimes called "computer inputs" or "computer peripherals").

Light Tech Tools

Several very simple modifications may help your child to be more independent at the computer. Four adaptations are:

Symbols For Choicemaking. Using symbols for choicemaking can offer students tremendous independence. Once the student has indicated his or her choice, a parent, sibling, or other helper can assist him or her in using the keyboard, mouse, or other tool to make the choice. This is a great "first step" while you are trying to find the best input



method, saving up money for needed input devices, or helping childen learn to use new peripherals. Symbols can be hand-drawn, copied from a symbol book, created using a symbol program such as Boardmaker (Mayer Johnson Co.), or created using the computer. You can present the symbols on a Choice Board, described in previous chapters, or place the symbols around the computer screen. If your child can't point to the symbols, you might want to place a mirror on top of the computer monitor, so you can see where your child is eyepointing.

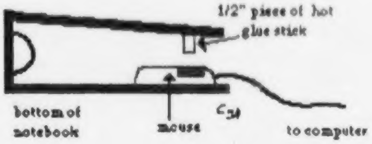
Keyboard Covers. Paper "keyguards" can be made to cover up the keyboard, with only one or two keys exposed. These can be made from poster board or construction paper, covered with contact paper on both sides, with holes cut out so that the student sees only the target keys. For use with Apple II single switch programs, key guards can expose the <OPEN APPLE> or <OPTION> keys. Here are some target keys and sample software programs:

<SPACE> (ex: Apple II, Curious George Series; IBM, Wheels On The Bus);
<SPACE> and <RETURN> (Apple II, 1st Letter Fun, Facemaker), or
<DOWN> and <RETURN> (Apple II, Print Shop)

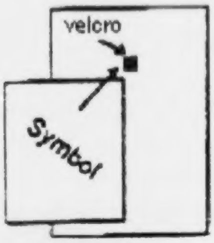
Keyguard Cover
(flaps velcro to
sides of keyboard)

Keyguard Cover Installed
(Open Apple Key
Exposed)

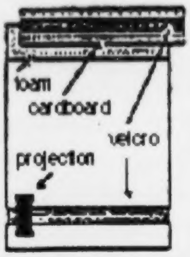
Mouse Pusher Notebook. Linda J. Burkhart has developed a simple, creative way to help students activate the mouse. A 3-ring binder with a hard cover is used. The mouse is secured inside the notebook (ex: place the mouse in the plastic pocket on the inside cover of the notebook). Then a small piece of gluestick for a hot glue gun is attached to the opposite cover, also on the inside. Now, when the child presses on the top of the notebook, the gluestick is pushed down, "clicking" the mouse. This works well with programs that rely on mouse click, rather than mouse movement. An example is *Thinkin' Things* for Macintosh (Edmark), which has a single switch setup. The cursor moves automatically, and the student only has to press the mouse pusher notebook to "click" the mouse!



Computer "Flap Switches". A variety of programs are available that permit page turning or other action with a single keystroke. For example, <SPACE> is used for *Reading Magic Library* for Apple or Macintosh (Tom Snyder Productions), while <RETURN> is used for *Berta Max Read-Alongs* for Apple (Berta Max). Any key can be used for the IBM program *Hocus Pocus* (Creative Communicating). A homemade "flap switch" can be affixed to the keyboard using velcro™. The student pushes down on the flap switch and a projection, such as a piece of gluestick, depresses only the target key. Instructions for making a flap switch are included at the end of this chapter.



Flap Switch: Top View



Flap Switch: Bottom View

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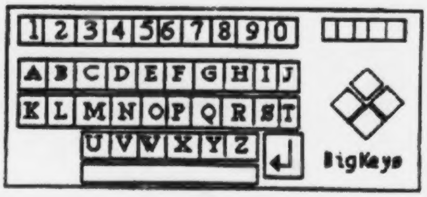
High Tech Tools

A number of modifications to make computers easier to use have been developed by several companies. You might hear these called "computer peripherals" or "computer hardware." Samples of equipment are briefly described in the following section, plus examples of how children might use them. In the examples, the equipment will be listed in bold print while the software will be italicized, to make it easier to separate them. For more information on these — and many other even more "high tech" approaches — please contact the companies, organizations, and reference books listed in this section and in the section "Resources for Computer Information."

BIG KEYS KEYBOARD (Macintosh, Windows IBM/PC — Greystone Digital / Don Johnston)

Description: This alternate keyboard has large, 1-inch keys with spacebar and return keys that are even larger. Letter keys are presented in alphabetical order using bright colors. Number keys are in a separate row, presented in correct left-to-right order. Big Keys can be easily attached to the computer through the standard keyboard port. It works with any software.


1 2 3 4 5 6 7 8 9 0
A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z
BigKeys

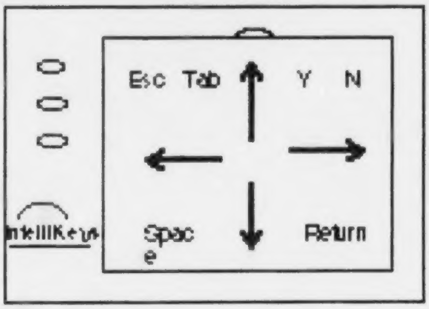
Target Group: This keyboard is intended for students with a range of needs, including cognitive delays, learning disabilities, and physical disabilities. It's also great for young children without disabilities, since it offers colorful, enlarged keys.

USING BIG KEYS AT SCHOOL: Students in Ms. Showalter's preschool love using the computer for group activities, and often choose the computer at "Center Time." The **Big Keys Keyboard** is great for Greg, who has visual impairments, because the keys are enlarged. It works well for 4-year-old Molly, since her fine motor skills are somewhat delayed. Typical students Juleah and Curtis also like the new keyboard because of the colorful keys. Ms. Showalter notes that Juleah, who knows most of the letters, finds them much more quickly now that she has switched to **Big Keys**, with larger keys, and letters arranged in alphabetical order.

USING BIG KEYS AT HOME: Molly's dad visited her classroom and saw how well she used the **Big Keys Keyboard**. She is not as adept at using the keyboard on their home IBM computer, since the keys are so small and are not in alphabetical order. Her dad takes Molly to CompuPlay to try out other keyboards also, but they decide that **Big Keys** works well for Molly. They check out a **Big Keys** so that they can make sure it works equally well with their IBM software before they buy it!

INTELLIKEYS (Apple II, IIgs, Macintosh, IBM/PC — IntelliTools)

Description: This is a "smart" keyboard that sends information directly to the computer. It can be plugged directly into Apple IIgs, Macintosh, or IBM/PC computers, but needs a special interface card for the Apple IIe. It has an active area of 7+" tall by 12" wide, with 576 individual key cells. Several keyguards are available for students with physical disabilities.



Target Group: This keyboard can be used for students with a range of needs, including cognitive delays, learning disabilities, and physical disabilities.

USING INTELLIKEYS AT SCHOOL: Students in Mr. Cruz's kindergarten class can choose to use either the **IntelliKeys keyboard** or the standard keyboard for their Macintosh computer, since both are attached at the same time and both are active. Students enjoy using the enlarged alphabet overlay to explore letters for "The Letter Machine", a fun alphabet activity on *Bailey's Book House* (Edmark). They use the number overlay that came with **IntelliKeys** to make it easy to acess software programs that mostly use numbers, such as some of the activities on *Millie's Math House* (Edmark). Mr. Cruz has also used *IntelliPics* (IntelliTools) to create software just for his class! They have been reading about dinosaurs and he has created a fun and simple dinosaur program, complete with a picture overlay for **IntelliKeys**, so that all the students can access the computer.

USING INTELLIKEYS AT HOME: Marcus is in Mr. Cruz's kindergarten class, where they use a Macintosh computer with **IntelliKeys**. At home, Marcus's family has an IBM compatible computer. Since **IntelliKeys** can be used with the IBM also, Marcus uses the IBM versions of the same alphabet and number overlays. He also uses IBM versions of the Edmark software, *Bailey's Book House* and *Sammy's Science House*, some of which he has seen at school. Since *IntelliPics* is not available for IBM, he only uses that program at school.

SWITCH INTERFACES (Apple II series, Macintosh, IBM/PC – AbleNet / Don Johnson / R.J. Cooper / TASH)

Description: A variety of switch interfaces are available to permit access to single-switch software. Some require special software, while others can be "set-up" to work with many software programs. Samples include:

1) **Macintosh Switch Interface** (Don Johnston): plugs into ADB connector on Macintosh keyboard (where the mouse plugs in);
2) **DJ PC Switch Interface** (Don Johnston): permits four different configurations, moving between setups on DOS or Windows computer by pressing a function key; plugs into any unused serial port on the computer;
3) **PC Switch Interface** (AbleNet): connects to one of four switches to operate software designed for switch control, with each switch controlling a different keyboard function; for IBM and compatibles; uses a 25-pin interface, with a nine-pin interface sold separately;
4) **BEST Switch Interface** (TASH): IBM-compatible interface permits use of up to three single switches to act as any three keyboard functions. For example, one switch can activate the return key, one can operate the spacebar, and one can activate number 1; this

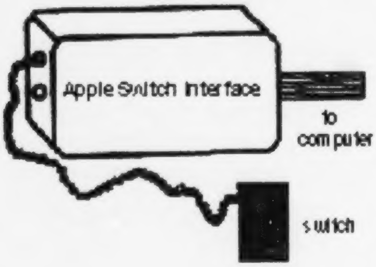
works well for games access. Connection is through serial or parallel port connection;

5) **Switch Adapted Mouse** (R.J. Cooper): This can be purchased for PC or Macintosh; one person moves the mouse to place the cursor and the switch user presses a switch to "click" the mouse!

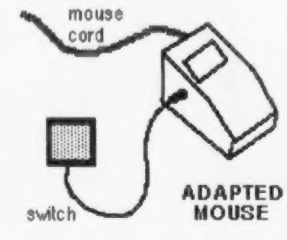
6) **Apple Computer Switch Interface** (AbleNet): connects through external joystick port (nine-pin connector) for IIe or IIgs models, with an I/O port adapter required for Apple II+ models.

Target Group: Switch interfaces are typically used for people who have a hard time accessing the computer keyboard or a mouse, such as students with physical impairments.

USING APPLE COMPUTER SWITCH INTERFACE AT SCHOOL: Ms. Anderson's preschool classroom received a used Apple IIgs computer when the elementary classes upgraded to Macintosh computers. At first they barely used it, but then Julie — the occupational therapist — brought in some fun public domain software, such as Switches, Pictures, and Music. Jeff, who has cerebral palsy and has a hard time getting close to the computer, much less using the keyboard, loves the sounds and the animation but really can't press the OPEN APPLE key needed to run the program, even after Julie makes a keyboard cover with only that key exposed. She borrows an Apple Computer Switch Interface and plugs in Jeff's favorite switch. Instant success! Ms. Anderson asks if there is any single switch software that would present stories to Jeff, and Julie promises to look. The next week, she brings in Storytime Single Switch Series, and John and Adam, his best friends, take turns turning the page. They enjoy rereading "Forgetful Makes Cereal", the class book for the month!



USING SWITCH ADAPTED MOUSE AT HOME: At home, Jeff's family has a Macintosh computer, with a Switch Adapted Mouse. When Jeff's switch is plugged in, the mouse "click" only works by pressing the switch. He uses it to access *Bailey's Book House*. His sister has made pictures that show the basic activities that he loves, "Read A Rhyme", "Kids Cards", and "Letter Machine". Jeff picks his favorite by pointing to the picture. Then his sister points to various items on the screen and Jeff verbalizes to tell her what he wants. She moves the mouse to those items, then Jeff pushes his switch to activate the mouse. Together they are quite a team, since neither of them can complete the program alone!

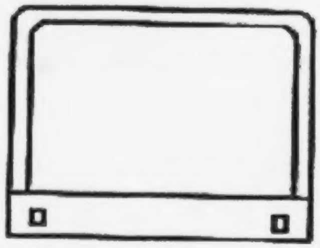


TOUCH WINDOW (Apple II, Macintosh, IBM/PC DOS/Windows — Don Johnston, Edmark)

Description: This equipment works just like a mouse for the Macintosh. The Touch Window can be placed directly over the computer screen and used to access the computer. The mouse functions of clicking and double-clicking can be carried out by simply pointing and touching on the Touch Window surface. The surface is very sensitive, making it a great choice for early learning software. If the Touch Window is mounted over the monitor screen and used with appropriate software, students simply touch the surface to provide activation.

Target Group: The Touch Window is great for young children and for children with developmental delays. The child must be able to reach out and touch the computer.

USING TOUCH WINDOW AT SCHOOL: Ms. Anderson's class recently "inherited" a **Touch Window** for their Apple IIgs computer. They tried it with some of their software and found that it didn't work with many of the programs. Julie, the occupational therapist, explained that the Apple version works only with selected software. She visited the Media Center in the elementary school and found several programs that work with the **Touch Window**. Several that all of the students enjoyed were the Stickybear series, including *Stickybear ABC, Stickybear Opposites,* and *Stickybear Shapes.* The children were delighted to make things happen simply by touching the screen, and the teacher found that this was a great way to teach beginning computer use to several of her students with developmental delays.



Touch Window

USING TOUCH WINDOW AT HOME: Jessie, a student in Ms. Anderson's class, has loved using the **Touch Window** at school. At home, her family has a Macintosh which her older sister uses. Her mom is interested in the **Touch Window** because Jessie has major trouble using the mouse. Jessie's mom was a little bit skeptical since she knew what a hard time Ms. Anderson had at first, finding software. Ms. Anderson consulted the occupational therapist and reported that the Macintosh version works with almost all software. Jessie and her mom were able to visit a local computer store and try out a **Touch Window** with early software, including *Kid Desk 2* and *Dr. Seuss's ABCs.* They were delighted with how fun and easy it was.

Sample Software

Thousands of software titles are available to support the learning of young children. Some software has been written specifically for children with disabilities, such as software that includes symbols and software that works automatically with a single switch. Many books and magazines are available with extensive software reviews. Organizations such as those listed at the end of this chapter often have software that you can preview, or even take home to try out on your computer. They also may have "public domain" software, software that is free or very low-cost. This section presents only a few samples of commercial software, to give readers an idea of the enormous range of topics and learning opportunities possible.

Bailey's Book House (IBM Windows, Windows 95 CD, Macintosh — Edmark)
Both disk and CD-ROM versions of this fun software are available. Activities include: making a card, exploring the alphabet, building and listening to fun rhymes, and creating simple stories from pictures. For children who cannot use the mouse or a Touch Window, both Don Johnston Inc. and IntelliTools have prepared "setups" to go with their computer peripherals.

Best Of KidTECH (IBM/Windows, Macintosh — Creative Communicating / KidTECH)
Single verses of several favorite children's songs are included on this disk. Samples include "Five Green and Speckled Frogs" and "I'm Bringing Home A Baby Bumblebee". Many other titles are available, such as *Monkeys Jumping On The Bed* and *Old Macdonald's Farm*. Materials can also be purchased to allow use of computer peripherals such as IntelliKeys.

Hokus Pokus (IBM — Creative Communicating)
This simple cause-effect program allows a child to add to a figure or an item each time s/he presses a switch. Animation and sound effects are given as a reward when any of the ten pictures is completed. A mouse, switch, Touch Window, or keyborard key can be used to operate the program.

Kid Works (IBM/Windows, Macintosh — Davidson)
This program is available on disks (*Kid Works 2*) and on CD-ROM (*Kid Works Deluxe CD*). It is a creativity program that lets children paint, write using pictures, and read their stories aloud. No modifications are included for children with disabilities.

Living Books (IBM, Macintosh — Broderbund)
These programs are available as CDs, requiring a CD-ROM player on the computer. Many wonderful titles are available, such as: *Dr. Seuss's ABC, Just Grandma and Me, The Tortoise and the Hare,* and *Little Monster at School*. Each one features lovely graphics and animation (though sometimes too "busy" for very young children or children with disabilities), speech output, and highlighted text. Many fun interactions are available on each screen. For children who cannot use the mouse or a Touch Window, both Don Johnston Inc. and IntelliTools have prepared "setups" to go with their computer peripherals.

Multimedia Nursery Rhymes (Macintosh, IBM, CD-ROM — BeachWare)
This CD-ROM presents forty nursery rhymes in four categories: singing ("This Old Man"), animal rhymes ("Little Bo Peep"), people rhymes ("Jack and Jill"), and fingerplays ("Ears Hang Low"). Each rhyme includes music, singing, and animation. Students can click on characters for extra sound effects and animations.

Sammy's Science House (IBM Windows, Windows 95 CD, Macintosh — Edmark)
Both disk and CD-ROM versions of this fun software are available. Activities teach: sorting, sequencing, and problem-solving. Children learn about science topics such as the weather, plants, animals, and seasons. Both Don Johnston Inc. and IntelliTools have prepared "setups" to go with their computer peripherals for children who cannot use the mouse or a Touch Window.

Storytime Stories (Apple II series, Macintosh — Creative Communicating)
All of the stories from the three Storytime stories by Pati King-DeBaun are available for the PowerPad, a large membrane keyboard (Apple IIe and IIgs) and for single switch input (Apple IIg only). For these programs, features include animation and computerized speech. The stories from Storytime Just For Fun are also available for use with the Macintosh and IntelliKeys. These programs feature digitized (human-sounding) speech and fun extension activities.

Storytime Songbook (Macintosh — Creative Communicating)
This software includes five fun songs based on five stories from the first Storytime book by Pati King-DeBaun. Highlights include: colorful graphics, animation, highlighted text, enlarged text, music, and digitized singing. Many different inputs are possible, such as IntelliKeys, single switch, and Touch Window.

Wheels On The Bus (Apple II series, IBM, Macintosh — UCLA Software)
Several versions of this song are available, for various computer models, and for use with various inputs, such as IntelliKeys, Touch Window, Single Switch, or PowerPad (a large membrane-surface keyboard). Each version permits children to sing five verses by pressing the corresponding picture on an overlay, or on the Touch Window.

COMPUTERS BELONG AT HOME TOO!

Buying A Computer

Many issues should be considered when buying a home computer. Here are a few!

Where Can I Go For Help Buying A Computer?
The first and best place to go is your child's school, especially if you want to buy the same computer the school uses. Some schools can even help parents get a special price on the computer and on computer software. Other great resources are your local CompuPlay, Easter Seals Society, United Cerebral Palsy Association, or Alliance For Technology Assistance site (see resources listing at end of chapter). Many of these organizations will have various computer models, peripherals, and software that you can "try before you buy." Before you buy a computer, ask these people about models that are good, whether your child needs a larger monitor, and so forth.

Who Will Use The Computer?
If this computer will be primarily for your child with disabilities, the most important issues are software and adaptations available, plus future compatibility with school computers. If older or younger brothers and sisters will use it too, compatibility with school computers should be considered. If you want to use it to help keep your holiday list up-to-date, write a book, or keep records for a home business, think about software you will need and courses that might be available at community colleges to get you going. If either parent wants to use it to finish up work from the office, then home-office compatibility is very important. What happens if some of these needs conflict?? Keep reading!

What Software Will Be Needed?
The answers to the last question should help you figure out the answer to this question. For example, if you need software for your business as well as for your child's learning, an Apple II series computer would be too limiting. On the other hand, if your child needs cause-effect software (ex: the child presses a switch and something happens), then the Apple II series is the best bet, with the Macintosh a close second.

What Adapted Computer Peripherals Will Be Needed?
For children with severe physical impairments, the Macintosh has the most adaptations right now. Each year, more adaptations are being developed for IBM computers, but this is a very slow process.

How Much Money Do I Have To Spend?
The least expensive computer will be the Apple II series, as used ones are available for several hundred dollars. However, you may have difficulty getting software as these computers have been discontinued. Remember that there is a great body of "public domain" (free or almost free) software for the Apple II series, which might help some. Used Macintosh and IBM computers are also available. Be sure not to get a model that is so old it is really not useful for your child, as that will not save you money in the end! Also, most parents — and their children! — are disappointed if they buy a discontinued business computer that does not have a color monitor. Nearly all children's software programs require color, or at least make great use of color.

Voice Output Needed
Voice output is especially important for students with disabilities. For some computers, extra equipment is needed. For example, a sound card such as "Sound Blaster" is necessary for the IBM. The Apple II series uses a speech synthesizer called the Echo. No extra speech equipment is needed for the Macintosh, as synthetic voices, called Macintalk, are already installed.

Setting Up The Computer Learning Center

Now that you have the computer, how should you set it up so that it is most useful? Hopefully, you decided what types of adaptations were needed before you bought the computer. Talk to your child's teacher and therapists (speech-language, occupational, and physical) for ideas on the best ways to set up the computer. Remember to consider the light tech ideas suggested, such as homemade computer key covers, adding symbols to the computer screen, and placing a mirror on top to see your child's eye gaze. Also visit the organizations listed in the next section to see great ideas for organizing your computer learning center. Good luck and have fun!

Organizations

Alliance For Technology Access
Technology Access Center of Tucson
4710 E. 29th Street, P.O. Box 13178
Tucson, AZ 85732-3178
Provides computer demonstrations, materials loan, parent training, etc.

Closing the Gap
P.O. Box 68
Henderson, MN 56044
(612) 248-3294
Publications & annual conference with the latest & greatest info on assistive technology

Colorado Easter Seals Society-Center for Adapted Technology
5755 W. Alameada Ave.
Lakewood, CO 80226
(303) 233-1666
Sells Public Domain software for switches & adapted inputs (Apple, Mac, limited IBM)

CompuPlay
c/o USA Toy Library Association
2530 Crawford Avenue, Suite 111
Evanston, IL 60201-4954
Provides local computer demonstrations, materials loan, parent training, etc.

Easter Seals Society
Technology Access Center of Tucson
4710 E. 29th Street, P.O. Box 13178
Tucson, AZ 85732-3178
Provides computer demonstrations, materials loan, parent training, etc.

United Cerebral Palsy
Technology Access Center of Tucson
4710 E. 29th Street, P.O. Box 13178
Tucson, AZ 85732-3178
Provides computer demonstrations, materials loan, parent training, etc.

Companies

BeachWare
9419 Mt. Israel Road
Escondido, CA 92029
(619) 735-8945
Sells software CDs such as Multimedia Nursery Rhymes and Goldilocks Gamebook

Berta Max (Educational Software Center)
P.O. Box 42859
Seattle, WA 98103
Software for IBM and Apple Series, such as Story Mix and Read-Alongs

Broderbund Software, Inc.
500 Redwood Blvd., P.O. Box 6121
Novato, CA 94948-6121
(800) 521-6263
Sells software programs for the Mac and IBM/PC KIDPIX, The Amazing Writing Machine, KIDCUTS

Creative Communicating
P.O. Box 3538
Park City, UT 84060
(801) 645-7737
Software for Mac, IBM, and Apple, including software that works with PowerPad, IntelliKeys, and single switch

Davidson and Associates, Inc.
P.O. Box 2961
Torrance, CA 90509
(800) 545-7677
Software includes KidWorks 2

Don Johnston, Inc.
P.O. Box 639, 1000 N. Rand Rd.
Waconda, IL 60084-0639
(800) 999-4660
Sells a wide variety of assistive technology products and software

Dunamis
3423 Fowler Blvd.
Lawrenceville, GA 80244
(800) 828-2443
Sells the PowerPad, software and a variety of computer resources

Edmark Corp.
P.O. Box 3903
Bellevue, WA 98009-3903
(800) 426-0856
Offers a variety of computer programs for the Mac and PC including Baily's Bookhouse, Sammy's Sciencehouse, etc.

IntelliTools
55 Leveroni Ct., Ste. 9
Novato, CA 94949
(800) 899-6687
Sells the IntelliKeys and a variety of supportive computer software for Mac & PC

Queue, Inc.
338 Commerce Dr.
Fairfield, CT 06430
(800) 232-2224
Sells a variety of software programs for Mac

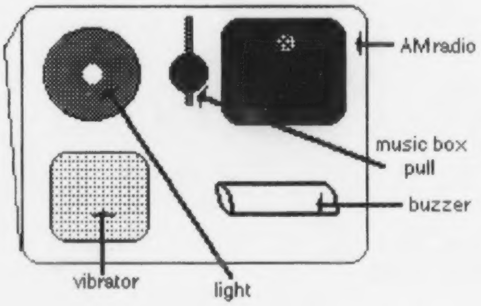
RJ Cooper & Associates

24843 Del Prado, Suite 283
Dana Point, CA 92629
(714) 240-1912
Sells the Cooper Ca, single switch software programs, and the switch adapted mouse

UCLA Microcomputer Team
1000 Veteran Avenue, Room 23-10
Los Angeles, CA 90024
(213) 825-4821
Offers Apple, Mac, and IBM software that works with single switch, Touch Window, IntelliKeys, and PowerPad

VI.

Adaptive Play: Learn To Play / Play To Learn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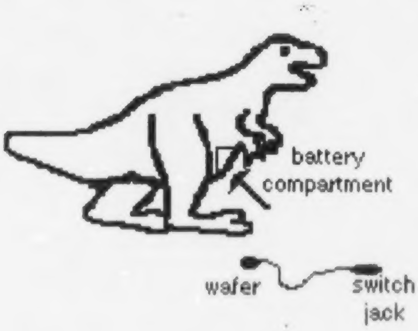
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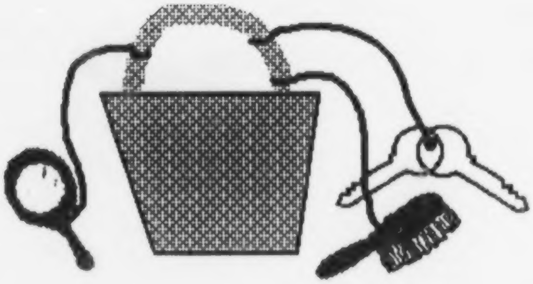

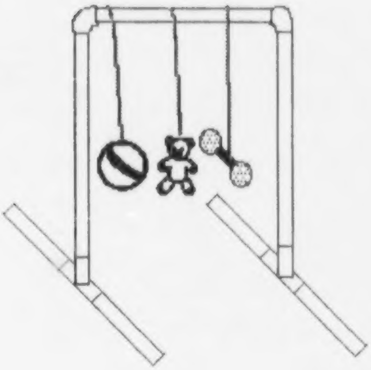

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INTRODUCTION

Most of us have happy memories of hours spent in play. We didn't even realize that while we were playing, we were also learning. Through play, children can learn about themselves, others, and objects within their world. How can we identify play? First, play comes from *inside*. The young child plays for the sake of play, not to achieve any particular goal. Second, it is *spontaneous* and *voluntary*. A child should choose to play, not be forced into it. Finally, play involves *enjoyment*. Always keep in mind that to truly be play, it must be fun for the child. This section will consider ways to make play enjoyable, successful, and as independent as possible for all children.

Why Play?

Successful, enjoyable play opportunities are especially important for children with disabilities, as described in Adaptive Play For Special Needcs Children (Musselwhite, 1986).

Supports Learning in Many Areas of Development. This includes the following areas:

- *Gross motor skills*, such as walking, running, throwing, and climbing can be supported through activities such as playground play and games such as hide-and-seek and ball play.

- *Fine motor skills*, such as reaching, grasping, manipulating (pushing, pulling, rotating), and releasing objects can be enhanced through general toy play. These skills are very important life skills for future activities such as: opening a door with a key, dialing a telephone, and inserting money into a vending machine.

- *Social skills*, such as turn-taking, sharing, and starting interactions with friends can all be increased through play.

- *Self-help skills* can be practiced and improved through a variety of play activities. Samples are feeding (tea party), dressing (playing dress-up), and personal hygiene (doll play).

- *Communication skills* can be supported through play, such as learning to follow instructions during ball play or teaching the names of things through a guessing game.

Develops Play Skills For Leisure Times. Most parents do not have the time to entertain their children full-time. Indeed, it is very important for children to be able to entertain themselves. This is a typical part of childhood and keeps children from developing what may be called "learned helplessness", a state in which they depend on others to fill all of their needs. So, a second goal of play is simply to play independently and with enjoyment.

Fosters Friendships And Inclusion. Children who can play cooperatively have an instant "in" for making friends and being more fully included in classrooms, and at parks and other community places. The social parts of play, such as turn-taking and sharing, are especially important.

Stages Of Play

Normal play development follows predictable stages. Each stage is briefly described below.

Exploratory Play. This involves manipuating toys and other objects like an infant, to experience new sights, sounds, tastes and textures. *Example:* a baby shakes a rattle, then puts it in his mouth; a one-year-old uses a spoon to bang on the bars of his playpen and a saucepan.

Functional Object Use. This refers to appropriate use of most common objects and toys. *Example:* a child might use a brush in her own hair, strike a zylophone with a mallet, or use a plastic hammer with a pounding bench.

Early Symbolic Play. This covers beginning pretend play, including pretend use of imaginary items. As they progress in this stage, children begin to play with dolls, or to combine two toys while playing. *Example:* early samples include pretending to go to sleep or drinking imaginary juice from a cup. More advanced play would be feeding a stuffed bear or putting a spoon in a bowl to dish out imaginary food.

Advanced Symbolic Play. At this stage, children begin to act out routines of their daily experiences, such as "playing house". Later samples of this stage show activities that are less familiar, such as "playing doctor". At first, toys and play materials are fairly realistic and life-sized. Later, children use miniatures, such as Fisher-Price™ play sets, or even use one object to represent another (a washcloth may become a blanket for a small stuffed animal). Also, children gradually develop more complex play activities, and tell each other what to do. *Example:* three children decide to "play doctor". They assign roles of doctor, nurse, and patient. One child uses a Tinkertoy stick as a needle, and another gives the patient an imaginary cup of medicine.

How To Support Children At Various Stages

Susan Attermeier, a physical therapist, suggests that parents and other caregivers may make play easier and more fun for children with special challenges by asking two questions (Attermeier, 1993, pp. 27-28):

1) *What stage of play is my child in?* Talk to your school team to help you find the highest level your child either uses, or you and the team think s/he could use with support;

2) *What is preventing my child from playing easily at this level?* The attached table describes typical play activities at each stage, and suggests how they may be modified slightly, to support children with various needs. Other suggestions are provided throughout this section.

Choosing Toys

Another holiday or birthday has rolled around, and once again your child has been given toys that s/he just can't use! Some are too difficult, others are too boring, and still others are not safe for your child. How can we select toys that are "just right"? When choosing toys, think about: the features of the toy itself, the needs of the child, and the needs of the home or classroom.

Toy Features

Safety is an important feature for any child, but may be even more important for a child who might have behaviors (such as throwing or banging) or conditions (such as drop seizures) that could increase the possibility of injury. Six safety conditions (Jeffrey, 1981) are: 1) Overall strength; 2) Materials used in making the toy (is it washable for children who drool? is it nontoxic for children who love to chew?); 3) Size of toy and its parts (are there parts that can be swallowed?); 4) Dangers resulting from falling (are there parts of the toy that protrude?); 5) Risks from misuse (would it be dangerous if thrown or used as a hammer?); and 6) Use in different settings (is it safe for unsupervised play?).

Durability is always important. It may be even more important if play patterns such as flapping or banging a toy cause greater stress on a toy than the toymakers expected.

Realism of a toy is another feature to consider. For children under two years of age, very realistic toys with many details are most desirable. However, as children grow older, less realistic toys may encourage their imaginative play. Obviously, parents and other caregivers should consider developmental level as well as age levels.

Flexibility of a toy is a related feature. Thus, very structured toys such as tea sets may limit the ways toys are used, while less structured toys such as general block sets may promote imaginative play.

Responsiveness of toy refers to toys that provide some type of reaction in response to the child's action. For example, the child pulls a toy duck resulting in wing flapping and a quacking noise. This feature may be especially important for children with severe disabilities. Studies have shown that "reactive toys" can cause children to interact with toys more often and for longer periods of time. Children may also develop a sense of power and control over their environment through this type of toy. Battery toys that children can activate with a switch would fall into this category, and are described later in this section.

Child Needs And Interests

Motor needs of a child should always be considered. Thus, toys that require strong pressure or fine motor manipulation will not work for many children with motor impairments. Instead, we must look at a child's strengths and abilities when choosing toys.

Sensory needs (especially hearing, vision, and touch) are also crucial. Toys can be found that give stimulation to sensory areas that are strong. Thus, infants who are blind or visually impaired might be offered toys designed to encourage exploration by touching and a range of interesting sounds.

Developmental needs can be very complex. While toys should be chosen to meet the child's developmental level, age appropriateness is also important. Thus, a four-year-old who is at an exploratory play level should not be given rattles to play with. Instead, she can explore a range of toys that offer various textures (ex: washable dolls), sounds (ex: zylophone, toy telephone), and sights (ex: light-up play car), but are typical for other four-year-olds.

Interest and attractiveness of a toy may be what decides whether a toy is used or not. This is a very individual feature. For example, one child might be drawn to toys with bright colors, another may prefer toys that are pink, another may like soft, quiet toys best, and so forth.

Home or Classroom Needs

Cost-effectiveness is often a stumbling block. Therefore, it is important to rate the actual cost of the toy against issues such as: the number of students who will be able to use the toy; replacement costs for parts such as batteries; and the variety of skills that can be taught using the toy.

Learning value of a toy is another feature that parents or school staff might consider. Thus, toys that support children's learning in several areas, such as social, communication and fine motor development, might be especially appealing.

How To Use This Information To Choose Toys

Toy features! Child needs! Home and classroom needs! Where do we start in choosing toys? One approach that we have found especially fun is to have a "Toy Fair" in connection with a parent/teacher evening. Each parent, teacher and therapist brings a toy that they have found especially valuable. If desired, they may take up to one minute to tell why that toy is especially good for their child. Parents and others can then use the features listed above to ask questions or further explore toys that seem right for their child, as shown in the two examples provided below.

> *George and Janis Wortham have decided that the most important toy features for their child are safety, durability and responsiveness. They decided on these features because their son, Josh, often breaks toys in unexpected places, causing sharp edges. After reading the description of toy features, they decided that Josh responds best to toys with lights and sounds. Another family, the Williams, have brought a fire truck that they have never seen. They talk to the Williams about durability and find out that this toy has lasted through three of their children. They examine the toy and find that it is a very flexible, durable plastic construction. The noise is loud but they decide that it would be a great one for Josh to use in his room with his brother.*

Angela Rodriguez is looking for toys for her young daughter, Marquita. Last Christmas, everyone in the family gave Marquita a stuffed animal. Since Marquite has limited use of her hands, most of the animals are lined up on shelves in her room! Angela is looking for toys that are inexpensive and can be easily activated. Since Marquita is also visually impaired and startles easily, Angela is hoping for toys that have soft, pleasant sounds. Another mom shows her a plush kitten that meows, walks, and moves its tail when activated, as well as a baby that "coos" and crawls when activated. She also tells Angela about a toy-lending library that has many battery toys that have already been adapted.

TOY MODIFICATION: LIGHT TECH STRATEGIES

Adapting Commercial Toys

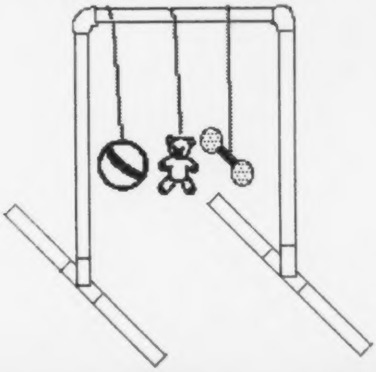
Have you ever found a toy at a store or a yard sale that is "almost" right for your child, or would be right "if only … "? Many simple adaptations can be used to make toys just right for your child. The following table presents ten strategies for making simple adaptations to play materials so that they meet the needs of your child.

Providing Physical Access To Toys

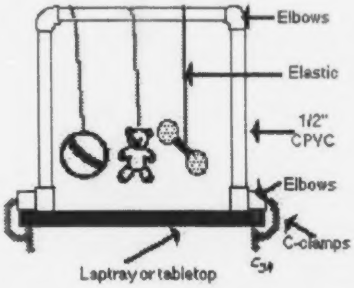
Activity Frames

"Activity Frames" are plastic frames shaped like an upside-down U, from which toys can be hung. They are similar to the "Baby Gyms" that are available for infants. Activity frames can permit children with severe motor impairment to access toys that would otherwise be out of their range, or would be dropped. They may be placed on the floor, attached to a table, or attached to another piece of equipment, such as a wheelchair laptray or stander. Some of the advantages are: 1) Toys are placed in the child's line of vision (may encourage head control); 2) Toys are easy to move, providing a feeling of success; 3) Toys can be retrieved if dropped since they are attached with elastic; 4) A bracelet suspended from the frame can be used as a stabilizer for the child's arm, allowing movement to activate toys on either side of the bracelet. Below are drawings of a floor-based and wheelchair-based activity frame. Both are made from ½" C-PVC (plumbing pipe), which can be purchased at a hardware store and cut with a pipe cutter. Plans for making these activity frames are included at the end of this chapter.

Floor-based Activity Frame

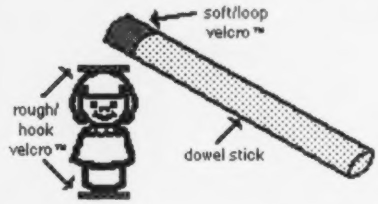


Wheelchair-based ActivityFrame



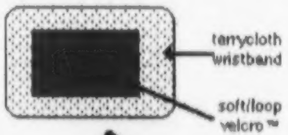
Grasping Aids

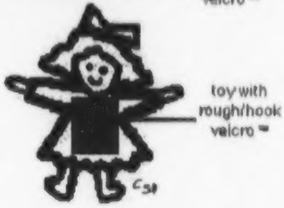
For children who have difficulty grasping play items, a variety of aids can be easily made to offer assistance. Some fabric naturally sticks to rough velcro™. This velcro-sensitive fabric is called "tempo-display-loop fabric" or "auto headliner". Small stuffed animals, dolls, or other toys can be made of this velcro-sensitive fabric, then stuffed so that they are very lightweight and easy to pick up using various holders with rough velcro™. Three variations of holders are described below. How-to instructions for each are provided at the end of this section.

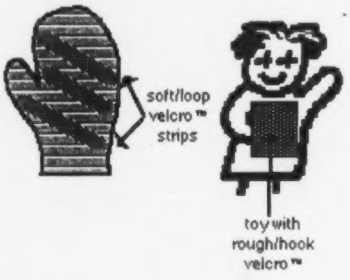


Dowel stick holder. For the child who can grasp a cylindrical item such as a dowel stick but has trouble holding on to small items, a dowel stick holder may be used to pick up objects such as small cars or "play people" that have velcro™ affixed. A partner may need to help the child release the items.

Palm holder. A palm holder with velcro™ can be placed around the child's hand to help achieve and maintain grasp. For an older child, a terrycloth wristband may be used, while for a young child a terrycloth ponytail holer may be opened up and placed in the child's palm. If rough (hook) velcro™ is added, these palm holders can be used to pick up and hold toys that have soft (loop) velcro™ attached.





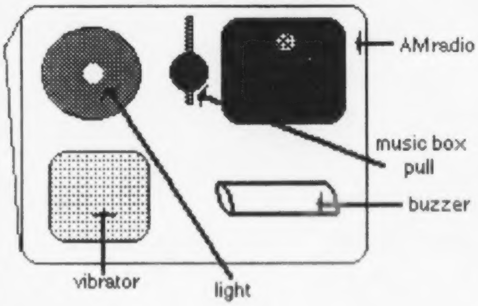


Velcro™ mitt. For children with no independent grasping, a mitt may be made with rough velcro™ attached. This can be placed on the child's hand and secured by velcro™ or elastic. It can be used to pick up toys that velcro™ sticks to, such as those used with palm holders.

Play Boards For Fun And Learning

For children at exploratory through symbolic play stages, sometimes the major barrier is just keeping the toys accessible! For example, a child who doesn't walk or crawl independently might have difficulty in exploratory play because items are constantly out of reach. A child who has difficulty with fine motor movements might be frustrated in playing with a tea set because the parts are small and keep getting knocked off the table. Another child might love the idea of playing with items in a purse, but might have difficulty removing items or having items fall on the floor before they can be returned to the purse. Each of these problems might be solved using a *play board*. A play board is a way to attach toys to a surface so that they are both visible and available. Various surfaces can be used, including triwall (3-layer cardboard), indoor-outdoor carpet, and pegboard. Play pieces are affixed by velcro™, elastic or shoestrings. Play boards can be placed on the floor, attached to a table, or mounted on a child's wheelchair laptray. Play boards can also be affixed to a "slantboard" that is then attached to the play surface (ex: table, tray of prone positioner). A slantboard provides an angled surface so that play materials (or books, or communication devices or displays) are in a more upright position (see How-To at the end of this section). Following are several descriptions of students, play activities, and play boards to make the most of those play activities.

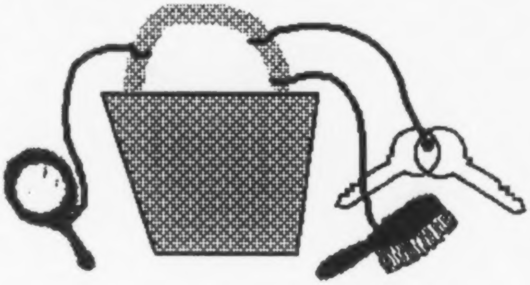
Busy Box Activity Centers



In Ms. Mitchell's class are several students with severe visual and hearing impairments. Last year she wrote a "mini-grant" to get money for toys that would really be fun early play experiences for these students. The ones her students seem to like best are the Busy Box Activity Centers from Enabling Devices, such as the Visually and Hearing Impaired Activity Center. It includes: a spinning soft cloth, a vibrating plate, and a fan that is turned on by a pull-ball. Another Busy Box has a bright orange plate that the students press to turn on an AM radio.

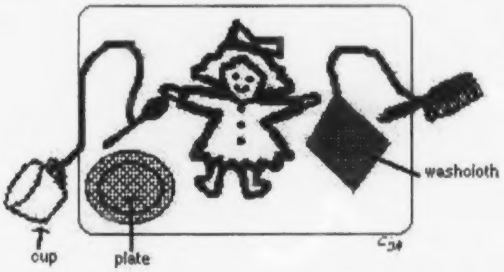
Exploratory Play Board

Jenna is a three-year-old whose most common play behavior is to throw toys, which are then picked up by her mom or grandma and returned to her. This was very cute when she was younger, but they are hoping that she will learn some new play skills and begin to independently play with toys! Jenna has good use of her hands and often graps her mom's purse, so her mom and her teacher decide to make a "play board" out of an old purse. They find an old purse with a flat bottom, a snap opening, and two straps that stand up. First, they insert small dowel sticks so that the purse will stay open. Next they find play items that would be fun to have in a purse, and attach them to the purse with 15" pieces of elastic. The items they choose are: plastic brush, unbreakable mirror, small change purse, squeeze flashlight, and plastic keys. Mom adds male (hook) velcro™ to the bottom of the purse so it will attach to the indoor-outdoor carpet on the floor. When she first begins to play with the purse, Jenna throws the items as usual. Surprise! They don't go very far! Gradually, she begins to explore the items, since they remain available to her.



Baby Doll Play Board

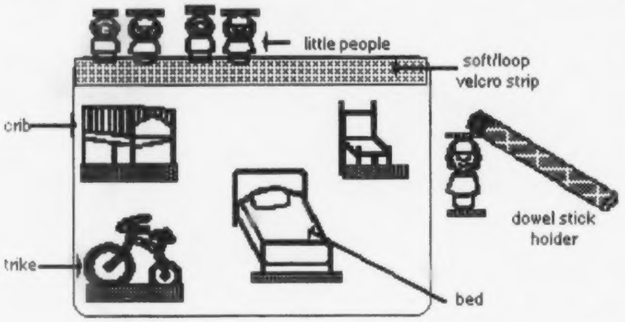
Alexandra loves baby dolls, but has very limited play behaviors with them. Her therapist, Kelly, wonders if this is because Alexandra has limited movement skills and finds it hard to crawl to get



extra play items, such as a blanket, bottle, or pacifier for the baby. Also, Alexandra often drops items, including the baby doll, then cries until someone picks them up for her. Kelly decides to see if attaching a baby doll and related play materielas to a play board would help her play enjoyment and development. Kelly created a play board using indoor-outdoor carpet, velcro™, and elastic. She placed the play board on a slantboard, so that Alexandra could keep her head in a more upright position while playing with the baby set. This was very helpful for Alexandra, in increasing her head control, trunk stability, and use of her hands. Having her head upright also helps Alexandra to drool less. Alexandra was very excited about her new toy. She and a friend, Natasha, played with it for the entire Center Time for three days in a row! Kelly stayed in the background to help for the first day, but Alexandra had far more independence now that she could retrieve items that she dropped.

Miniature Play Set

Brad is a four-year-old who is very social and very bright. Brad enjoys a wide range of toys, and loves to pretend. He has cerebral palsy and uses a wheelchair. In most play activities, his mom, dad, or five-year-old sister, Melody, has had to physically manipulate his hands to help him pick up and move toys. Brad really enjoys being independent as much as possible, so his family has decided to make him a play board, to see if it will help him access miniature play people. They chose to adapt the small playground set since that is a favorite of Brad's and Melody's. They used the directions provided at the end of this section. Now, each time they play, Brad and Melody decide together where to set up each piece of playground equipment. For example, Melody holds up the see-saw, and Brad eye points to the velcro™ spot on the play mat where he wants to place that item. Melody also holds up two little people to let Brad choose which one he wants by eye pointing. At first, Brad still could not manipulate the little people because he kept dropping the dowel stick holder. His mom came up with the idea of unfolding one of Melody's pony-tail holders and using it to keep Brad's hand closed around the dowel stick holder. On days when Brad is especially "tight", his mom or dad sometimes helps him to play by supporting his arm right above the elbow. Although he is not totally independent, Brad really enjoys playing with the same toys that his sister enjoys.



TOY MODIFICATION: HIGH TECH STRATEGIES

The wealth of battery toys currently available in stores, through catalog sales, and at yard sales and swap meets is a real help for children with disabilities. These are often easy to adapt because they are controlled by an on/off switch that provides a "point of adaptation". Here are three reasons that we might want to adapt a toy or device:

1) To provide *experiences* and *independence* that would otherwise not be accessible — thus, a preschooler with limited hand and arm movement might use a simple switch to operate a battery powered tape player to listen to a story or song without waiting for an adult to help;

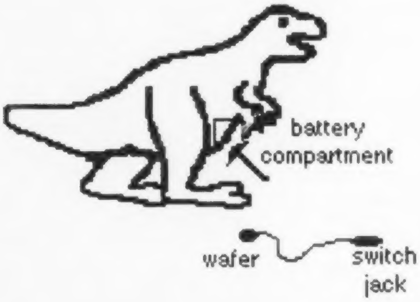
2) To provide *opportunities* for *interacting* and *reacting* to our surroundings by taking best advantage of visual, auditory (hearing), tactile (touch), and motoric (movement) capabilities — thus, a young child with both vision and hearing impairments might activate a switch to turn on a vibrator located inside a stuffed toy, a battery fan, or a cool air vaporizer located near his chair;

3) To privide interactive and reactive opportunites in *natural environments* and during *routine times* — thus, a young child might raise her hand to activate a switch attached to a wristband to make a painting wheel spin around during art, to activate battery scissors when making a card for grandma, or to operate a battery-powered stirrer when helping her mother cook.

Sonny Johnson, 1993, p. 32

What is Battery Adaptation?

No, you do NOT need to become an electronics whiz to adapt toys for your child! Even if you decide to purchase toys, it helps to understand a few basic principles so you can be a better shopper. You can buy toys that have been *permanently adapted*. This means that an external switch must be used to activate it. You can also *temporarily adapt* toys, using a battery interruptor. A small disc or wafer is placed in the battery compartment, usually between a battery end and the battery compartment, with a switch jack at the other end of the interruptor. The child's switch is plugged into the jack and the toy is turned on. The toy will now work when the child activates his or her switch, as shown in the illustration.



Several companies make toys that are permanently adapted, or sell battery interruptors that may be inserted into toys you already own, or toys you want to buy. Three such companies, AbleNet, Crestwood Company, and Enabling Devices / Toys for Special Children, are included in the Resource List at the end of this section. There are many resources available to the Do-It-

Yourselfer. Books or chapters that are especially good are included in the Resources section of this section.

Interactive Strategies For Battery Devices, or The Bear Beat The Drum … Now What?

Many parents and teachers are delighted the first time a child uses an adaptive switch, but the delight can soon wear off if all the child does is activate the same toy, or even a few simple toys, in the same way, over and over. Battery toys and devices can be used to help children engage in play at all stages of play development. Talk to your school team or therapists about which switch or switches are most appropriate for your child. The following ideas show how battery toys or devices may be used to help students fully participate in a variety of fun play activities:

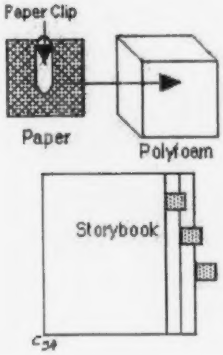
Play Stage	Sample Toy	Description of Activity
Exploratory Play	*Graphics Mobile* (Enabling Devices) *Police Car* (Crestwood Company)	A mobile that has a motor drive attached A car complete with seven lights, siren sounds, flashing eyes, etc.
Functional Object Use	*Battery Stirrer* Betty Crocker (K-Mart, etc.) *Clip-On Fan* (AbleNet)	Used to stir up a drink by pressing to start, then pressing again to stop With a switch, child can activate fan for cooling or drying art activities
Early Symbolic Play	*Pretty Poodle* (Enabling Devices)	Child helps dog move to get its bone, or its water dish, or its blanket
Advanced Symbolic Play	*Susana* (Crestwood) *Robot* (Enabling Devices) *Pouring Switch* (Enabling Devices)	It's a tea party! Using a crawling doll or a robot, child sends foods back and forth, pours tea, etc.

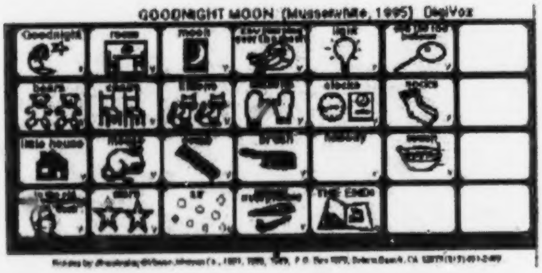
SUMMARY

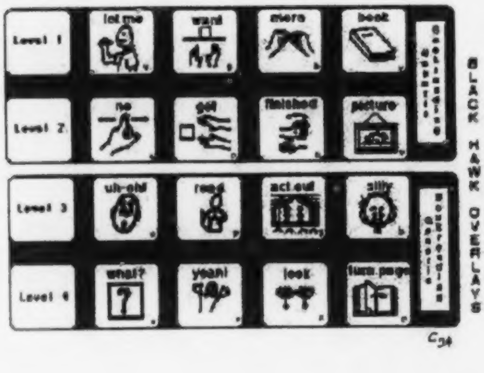
Play is too much fun and too important a part of childhood to be missed or restricted. For persons interested in learning more about play, resources and references are provided at the end of this manual. Contact your local Lekotek or other toy library for information about play sessions and borrowing adapted toys.

VII.

Emergent Literacy All Day Long!


Paper Clip
Paper
Polyfoam
Storybook
c34


GOODNIGHT MOON (Musselwhite, 1995) DigiVox
Goodnight
room
moon
light
bears
clocks
socks
little house
brush
nobody
air
THE END!


Level 1
let me
want
more
book
Level 2
no
get
finished
picture
Level 3
uh-oh!
read
act out
silly
Level 4
what?
yeah!
look
turn page
BLACK HAWK OVERLAYS
c34

BEST COPY AVAILABLE

As parents and teachers, we all hope for our children and students to grow up to be successful readers and writers, and to love reading and writing. We can help this to happen by fun literacy-related activities both at school and at home. This section will introduce the idea of emergent literacy, and give ideas to support its development in all children.

WHAT IS EMERGENT LITERACY?

The term "emergent literacy" means that literacy learning, like language learning, starts not at kindergarten or first grade, but is a continuous process. In fact, it begins in infancy, with the sounds, songs, and rhymes that young children hear, and the books, pictures, and words that they see. Emergent literacy refers to both reading and writing, and recognizes that they are interrelated, meaning that they develop together. Young children do not first master reading, then begin to write. Instead, they can learn both at the same time, and have fun while doing it!

IMPORTANT ISSUES IN LEARNING TO READ

Researchers who study how children learn to read have identified a number of issues that are especially important. Seven key factors are described below, as listed in Getting Started In Whole Language (Cutting, 1989). Specific strategies for young children and for children with disabilities are suggested for each key factor.

Expectations Of Learning

It is very important that parents, other caregivers, and teachers all show children that they expect them to learn to read and write. Although this sounds obvious, sometimes this does not happen for children with disabilities, especially children with severe disabilities.

Strategy. Let your children or students know that you believe they will be readers. Praise and show interest in their early reading and writing attempts.

Rachel enjoys being read to by her mom. Sometimes after her mom finishes, Rachel picks up the book and begins reading the story to her doll, teddy bear, or even her cat! Her mom knows that Rachel is not independently reading the words, but has memorized parts, and makes up other parts of the story. She is very proud of Rachel's efforts, and tells Rachel: "I think that's Teddy's favorite story — he lives it when you read to him!" Rachel giggles and keeps reading. Later, Rachel is drawing a picture for her grandfather, who lives out-of-state and has not been well. She scribbles some words on it, and her mom asks: "What does this say, Honey?" Rachel points to each scribble and tells the message: "I love you Boppy. Get well and come see me. Love, Rachel and Leroy [the cat]*." Her mom says: "That's a terrific letter — let me get a stamp so we can send it tomorrow."*

Rachel's mother accepted her reading and writing, and helped her to feel important and valued. This showed Rachel that her mom expects her to be a reader and a writer.

Models of Reading — Being Surrounded By Readers

If children see the important adults in their lives reading for pleasure, they are more likely to want to learn to read. This includes parents, teachers, grandparents, and babysitters.

Strategy. Make sure your children "catch" you reading and writing! For a preschool or kindergarten teacher, this might mean that the teacher occasionally picks up a book during rest time and reads in front of the students. For a parent, this means making opportunities to read in places that children can see, such as in the family room while children watch a favorite video. It also means simply pointing out things that adults read to gain meaning.

Dad and Larry are cooking tonight. Dad holds up the Rice-A-Roni box and points to the instructions as he says, "Let's see ... how much water should I add? ... O.K., Luke, it says right here [holds up box for Luke to see], *one cup." Later, they are off to the store to pick up a video. As he straps Luke into his wheelchair, Dad says, "Omigosh! I almost forgot to leave your mom a note!"* [Dad walks over to the write-on board attached to the refrigerator.] *"O.K., what should we say? How about, 'Larry and I went to Disneyland for a week?' No? How about, 'Larry and I went to get a video. Back by 7:00. Love, Dad.'"* [Dad speaks the message slowly, as he writes each word.] *At the video store, Dad pulls a piece of paper from his pocket and writes a large 'G'. He tells Larry that they are looking for a movie with the 'G' label. Larry points to a brightly colored movie. Dad takes it down from the shelf and they compare — "Nope," says Dad. "That's an 'R'. We're looking for a 'G'. I think they're over here." He picks up a couple of movies and points to the titles as he reads "Aladdin" ... "The Tales Of Benjamin Bunny". Larry vocalizes loudly to choose Aladdin, so they check it out.*

Practice, Practice, Practice, Then Practice Some More!!!

Most people would agree that good athletes, whether they are in high school or the Olympics, must practice to be truly great. The same is true for truly great readers and writers! It is very important to give children many opportunities, and to let them actively participate in reading and writing activities. Studies also show that children who learn to learn early and well usually read the same books over and over, then over and over again. How do you know which books are favorites? Because they tell you, "Read it again, Mommy" or "Read it again, Teacher." Sometimes it drives parents and teachers crazy but it is extremely important for children to have practice at "repeated readings." As children hear the same story many times, they get familiar with the plot, the pictures, the language of the story, and any repeated lines in a story (such as "Green Eggs And Ham") or predictable parts of a story (such as what will happen to the next little pig!). Then children can begin to "take over" the reading activity. Now they want to point out the pictures, fill in repeated lines, or predict what's going to happen next. This is a very important step on the road to reading, and should be encouraged!

Strategy. Give your children many opportunities to look at stories, to listen to stories, and to play with writing materials. While you are reading, pause to let your child fill in repeated lines or talk about the story, but don't force your child to participate. Just make it fun and s/he will want to be part of the storybook routine! It's great to read books at bedtime or rest time. Be sure to let your child pick the same story over and over again.

Jamie's mom is pretty overwhelmed, as a single mother with two young children. She has tried to think of ways to make reading and writing a part of every day, without spending a lot of extra time. She and Jamie's therapist sat down together and came up with a list of ideas, some of which the therapist got from the book: Read To Me: Raising Kids Who Love To Read *(Cullinan, 1992): 1) Put books in places where Jamie will find them, such as by her bed, in the car, and in her playhouse; 2) Keep plastic books in the tub of toys by the bathtub; 3) Make videos of Jamie's Grandma, reading Jamie her three favorite books — that way, Jamie can read them anytime she wants!; 4) Put a baggie of washable markers and a pad of paper in the car, so Jamie can scribble while she rides home from day care; 5) Talk to the day care teacher about letting Jamie bring a book to read each day; 6) Promise to read Jamie at least two books at bedtime every night.*

Pay Attention To Meaning, Not Just Form

This factor means that literacy activities should be meaningful and functional. In most homes, children watch their parents and others reading for "real" purposes, not because someone told them it was time to read. This also means that later literacy training should be functional, not just drill work.

Strategy. Make literacy meaningful to your child by using reading and writing for activities that are real.

Allie loves to help her mom cook. Most days, that just means that Allie helps to stir and hand items to her mom. Once a week, they cook using a picture-based recipe book that Allie's teacher told her mom about. The recipes are easy for Allie to follow since there is a picture for each step. Allie has trouble drawing, since she doesn't have perfect use of her hands. Her big sister helps her make pictures using Twirl-O-Paint (AbleNet). *Allie really enjoys it, because her pictures are so colorful. Then her sister helps Allie write a message on the picture and send it or take it to someone special.*

Motivation

Many adults with very severe disabilities have learned to read and write "against all odds". When asked how they learned, they often reply that they had "stubborn" personalities, and were simply unwilling to give up. We must all work together to help children develop this motivation. It is important to encourage children to have fun while learning.

Strategy. Fun activities can be planned to enhance literacy. In addition, children should be helped to choose reading and writing materials that they enjoy. Computer-related activities can also be very motivating for many children.

Roland, a four-year-old with developmental delays, didn't seem too interested in books or drawing. His parents decided to try a few things to make reading more fun. They go to the library every other week for "story hour", and Roland's mom helps him to pick out books. She leaves the books in places where Roland is likely to find them and have time to look at them. For his birthday, his mom asked his aunt and grandmother to buy him a few fun toys to support early writing, such as Etch-A-Sketch, Doodle Pen, colored paper tablets, scented markers, and a large bucket of sturdy crayons. From Mom and Dad, he got a portable writing center with a place to store all of his new toys. One of the best tricks was to get a friend in the neighborhood to come over and share these toys. Once Roland saw how much fun Jeff was having with the Doodle Pen, he wanted to try it!

Success

It is so important for children to have success early and often so that they keep trying. Setting up children for success is a great way to start.

Strategy. When your children are just starting to talk, you identify their early speech attempts as successful words. For example, the baby says: "duh-duh-duh", and Mom says: "Oh, Robert, he said 'daddy!'" In the same way, adults can show support for early reading. For example, parents can "brag" about their child's early reading attempts, and can put their artwork in a special place so that everyone will see it.

Donny spent his Saturday morning watching cartoons with his sister, then playing with blocks and cars. His sister read him a book, which he later read to his dog. He read it differently from the words in the books, but he did pick a few of the actual words. When his dad came home from work, his sister bragged about Donny, with Donny listening: "Hey Dad, Donny read Goodnight Moon to Lucky today. It was cool. He knows lots of the words." Dad grinned and gave Donny the High Five, saying: "I'm proud of you, son." Later, Donny's mom opened his backpack and found a drawing he had made at preschool. She asked him about it, and helped him paste it on the refrigerator so that everyone could see it.

Materials

Sometimes, young children with disabilities are not given books, crayons, markers, and other literacy-related materials. It is vital that all children have access to many different kinds of literacy materials from a very early age.

Strategy. The section on choosing books gives tips for books that children will enjoy. The section on "Simple Modifications" provides ideas for easy adaptations so that all children can use books.

CHOOSING BOOKS

There are so many books available for children. It can be overwhelming trying to pick books that are just right for your child. Here are some tips:

- Look at your child's interests. If she likes trains, pick out at least one book about trains.
- Talk to your school team; they know your child, and his or her current stage of literacy development.
- Pick at least some books that use rhythm, rhyme, and repetition. Good examples are Dr. Seuss books and books by writers such as Eric Carle, Eric Hill, Mercer Mayer, and Bill Martin, Jr. These features help your child to become successful at remembering the language, and guessing what is coming next.
- Use good guidebooks such as: Read To Me: Raising Kids Who Love To Read and Let's Read About: Finding Books They'll Love To Read, both by Bernice Cullinan.

MAKING YOUR ENVIRONMENT "PRINT-RICH"

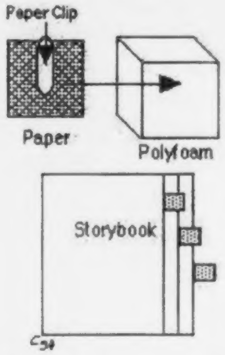
Researchers have found that children whose homes have many different literacy-related materials are more likely to be early readers, good readers, and to enjoy reading. How can you tell if your home is "print-rich"? Walk through the house and look around. Are there books all over the house? Are there many different kinds of books for children to enjoy, such as nursery rhymes, books about songs, storybooks, and non-fiction books (ex: books about dinosaurs)? Are there any children's magazines or posters? Perhaps you could print your child's name in fancy letters and have her decorate the page, then put it on the door to her room. Writing materials are also very important, such as crayons, markers, colored pencils, paint sets, and lots of paper to draw and write on. These do not have to be expensive. For example, if you work in an office, perhaps you can "recycle" some of the paper, taking it home for your child to draw on the backs of pages. The important point is that everywhere your child looks, he or she sees materials that make learning to read and write look interesting and exciting.

SIMPLE MODIFICATIONS

Many simple modifications can be made for children with severe disabilities, including children who are not yet speaking. These ideas involve acessing books, and giving children ways to read parts of a book or talk about a book.

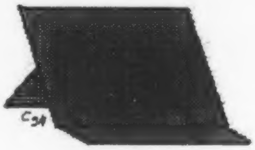
Simple Access To Books

Children may need special help in holding books, or turning the pages of books. Here are a few ideas for making children with physical impairments more independent with books.

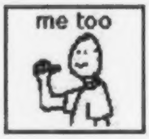


Page Fluffers. "Page fluffers" are used to separate the pages of a book so that children can more easily turn the pages, using the whole hand, or even a headstick. Page fluffers are made of sturdy paper (ex: scraps of old file folders), paper clips, and polyfoam. They are clipped to the book pages and can be used with any book. They are reuseable. They can be stored in a baggie or a cannister near where children read, and quickly added to pages when it's time to read. Instructions for making page fluffers are included in the "How-To" set at the end of this section.

Book Stands. A book stand or easel can be used to support a book for student use. This may help the child in page-turning, and may even allow full independence. Another benefit is that book stands may reduce drooling by allowing the child to keep his or her head in an upright position, or will at least keep the book out of the path of drool. This is important when using books that do not belong to the child, such as library books. One simple bookstand can be made from an old desk calendar. Many desk calendars (ex: The Far Side) come with stiff cardboard or plastic backing that makes an excellent book stand. This is a great recycling opportunity — simply pull the calendar from the backing and use the backing as a quick, portable book stand. Add velcro™ to the bottom of the book stand to make it more stable. The bookstand can then be affixed to indoor-outdoor carpet on the floor, a table, or the student's laptray.



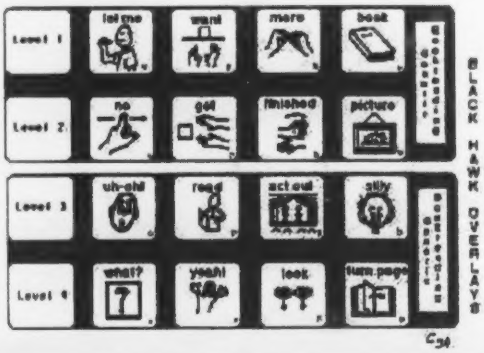
Repeated Lines In Storybooks



Repeated lines can be a lot of fun because they let children have success in reading. For example, the book Me Too by Mercer Mayer, and many repeats of those two words, so that children can repeat them over and over, gives children lots of chances to practice. For children who have a hard time remembering the words, you might want to make picture symbols to give a hint, such as those included in the "Symbol Pages" at the end of this section. The messages can also be recorded into devices, as described in the chapter, "High Tech / High Hopes — Using Devices".

Sample General Displays

This overlay is one that can be used with a wide variety of stories. It may be light-tech, such as a 16-Location or 36-Location display made from a file folder, and presented on an easel or on the child's laptray. High-tech versions can also be used, with messages stored into various communication output devices. The purpose of this display is to encourage active participation in general storybook interactions. For example, symbols or messages may be included to allow children to make requests or give directions (LET ME, TURN THE PAGE),



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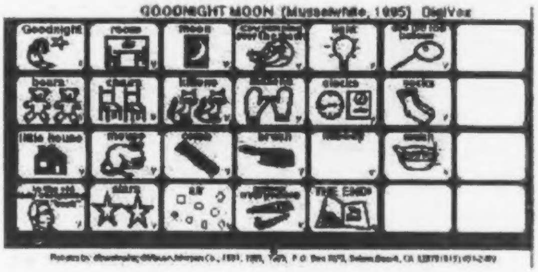
ask question (WHO IS THAT? WHAT'S THAT?), negate (NO DON'T), or make comments (SILLY, UH-OH!). It is a great overlay to use at home for those occasions when families wish to include a symbol display in their storybook interactions. However, this should be done only if the parent feels comfortable with the display, and the child enjoys it.

Sample Story-Specific Displays

Occasionally, parents might want to use symbol displays that match the language of books that children are using. Story-specific symbol displays may be used with any books, and provide excellent support for literacy, language, and communication goals. Sample displays are provided in the "Symbol Pages" at the end of this section. Several writers have ready-made storybook displays to go with particular storybooks that young children enjoy. These include:

GOODNIGHT MOON (Musselwhite, 1995) DigiVox



Storytime Books: Pati King-DeBaun has prepared a series of stories in three books. Each story includes line drawings, symbols on the pages, symbol displays for songs and stories, and extension activities for art, writing, and so forth. These include: Storytime (1990), ten stories about routine events such as dirty clothes, cooking dinner, and making a birthday cake; Storytime Just For Fun, five stories such as "Five Little Frogs" and "The Old Lady", Storytime Holidays, six stories relating to holiday activities; and an upcoming book, Babes In Bookland, with five stories for infants and toddlers.

Hands-On Reading and **More Hands-On Reading**: These overlays and activities are designed to go with favorite children's books such as Peanut Butter and Jelly and The Very Hungry Caterpillar. Book 1 includes stories in categories of food, clothes, animals, and hygiene/body parts, while Book 2 covers the categories of holiday, family fun, and seasons of the year.

SUMMARY

Parents and other special adults can make a huge difference in helping children to become readers and writers. This can be done through activities that are fun and support parent-child or adult-child interaction. We are not suggesting that parents become teachers and have drill-and-practice sessions with their children. The suggestions for adapting materials and using devices to support literacy are only suggestions. Parents should decide what is appropriate for their homes and what level of involvement feels "right" for them. The most important way parents can help their children is to enjoy reading and take time to share the richness of books, art, and writing experiences with them.

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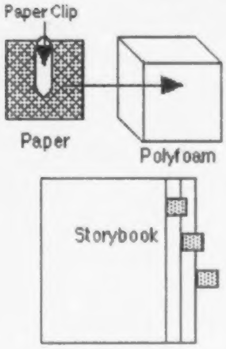
PAGE FLUFFERS (Musselwhite & King-DeBaun, 1997)



Use "page fluffers" to separate the pages of a book, to permit page turning with a whole hand or a headstick.

1) Cut a piece of heavy paper (e.g., file folder) 1" x 12".
2) Space 12 paper clips evenly over the paper.
3) Cut a piece of polyfoam the same size as the paper.
4) Hot glue the foam onto the paper, leaving one side of the paper clips exposed.
5) Cut into 12 pieces, 1" square.
6) Use in books by affixing to the back side of pages, in a staggered arrangement.

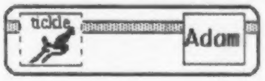
CHOICE BOARD (Musselwhite & King-DeBaun, 1997)

Songs and stories can be constructed using a slot-filler format. A choice board is used to provide the frame and the choices of words to insert. Directions are as follows:

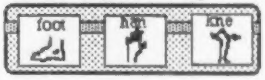
1) Cut a piece of foam core art board, 15" x 4".
2) Cut a length of soft velcro 15", then cut velcro lengthwise.
3) Attach velcro to each side, 1" from top of choice board.

Typically, the frame sentence ("tickle" + empty slot + "name") is placed on the front of a choice board, with choices ("foot", hand", "knee") placed on the back. The student picks a symbol from the back, places it in the slot on the front, then "sings" the song while the facilitator cues as needed.

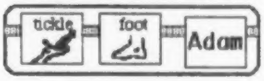
SLOT-FILLER (Empty Slot)



CHOICES (Back of Song

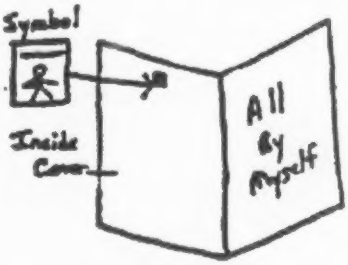


SLOT-FILLER SENTENCE (Completed)



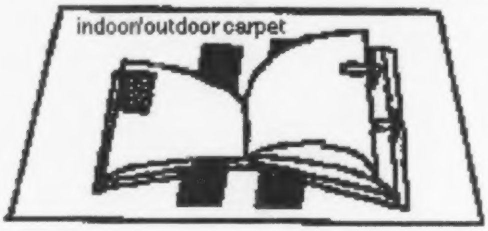
ADAPTATIONS FOR REPEATED LINES (Musselwhite & King-DeBaun, 1997)

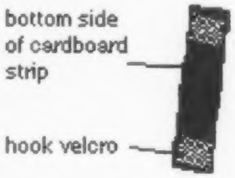
These simple adaptations prepare of-the-shelf books for efficient and successful use. Repeated lines may be recorded on a loop tape for use with an adapted tape recorder or recorded on communication devices.



1) Prepare a symbol to represent each repeated line. Color symbols as appropriate, laminate, and add male (hook) velcro to back of each.
2) Affix female velcro to matching book, for storing repeated lines symbols.
3) Add a piece of colored PVC tape to spine of book (to code as a story with repeated lines).
4) Highlight repeated lines in text of book.
5) Remove the symbol from the book and affix to switch, communication display or communication device when reading.

BOOK HOLDER (Burkhart, 1993)





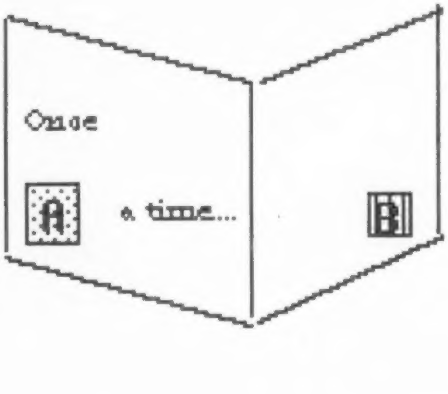
A book holder can be used to hold a book in a stable position with the front and back covers opened while the student reads.

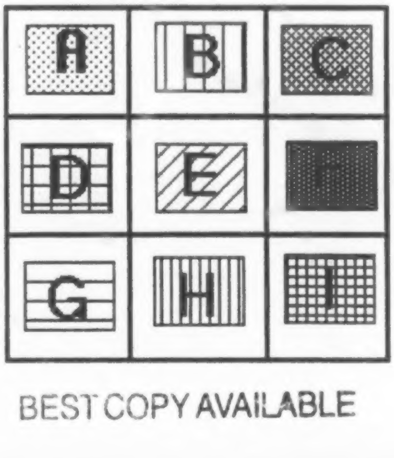
1) Cut out a piece or indoor/outdoor carpet 18" x 15".
2) Cut two long rectangles of cardboard (e.g., poster board, folder) 2" x 12".
3) Affix stickyback male (hook) velcro at the top and bottom of underside of cardboard rectangles. It will adhere to the carpet.
4) Place book on top of the carpet square. Use the cardboard rectangles to hold front and back covers down.

COLOR CODED OVERLAYS (idea from Burkhart, 1993)

This idea suggests adapting short, simple books for short term use, without the hassle of creating a symbol communication display for each book. Here is an abbreviated version of the directions (compiled by Caroline Musselwhite, 1995):

1) Cut out 1 1/2" squares of six different colors of Post It notes, two squares per color (total of 16 squares, 2 yellow, 2 blue, etc).
2) Write the alphabet letters A-F, with the same letter on both colored squares (e.g., yellow = A; blue = B).
3) Using a blank 8-location Macaw overlay, place one set of colored squares, in alphabetical order (see illustration).
4) Place matching set of squares on the book pages (see illustration).
5) Record the book pages into the Macaw. Now when the student sees a yellow Post It with the letter A in her book, she presses the matching square on her device and it reads the page!





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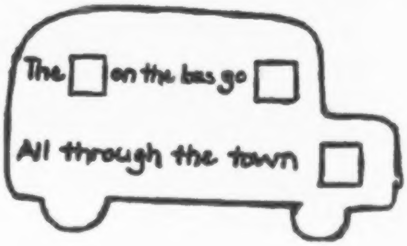
WHEELS ON THE BUS SONG DISPLAY

1) Cut out the shape of a bus from a piece of construction paper (about 10" high and 17" wide).

2) Write the following sentence in large letters, leaving spaces for symbols:
    The ______ on the bus go _______

    All through the town.

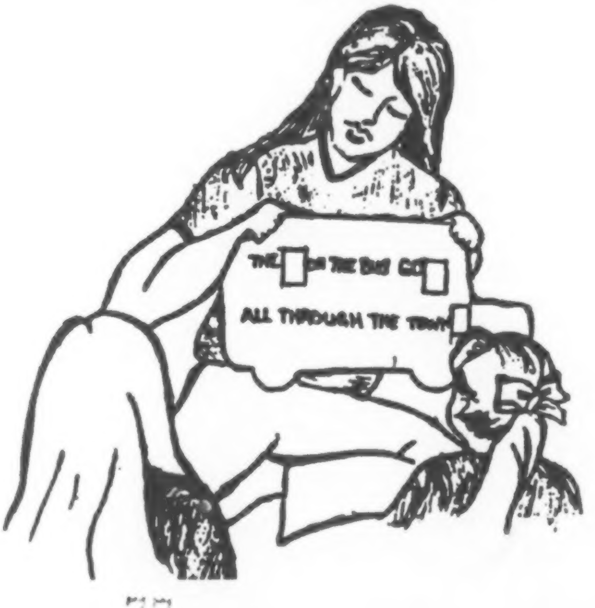


3) Draw a 2" square in each of the spaces. Laminate the bus. Put small pieces of rough (male) velcro at the top center of each square.

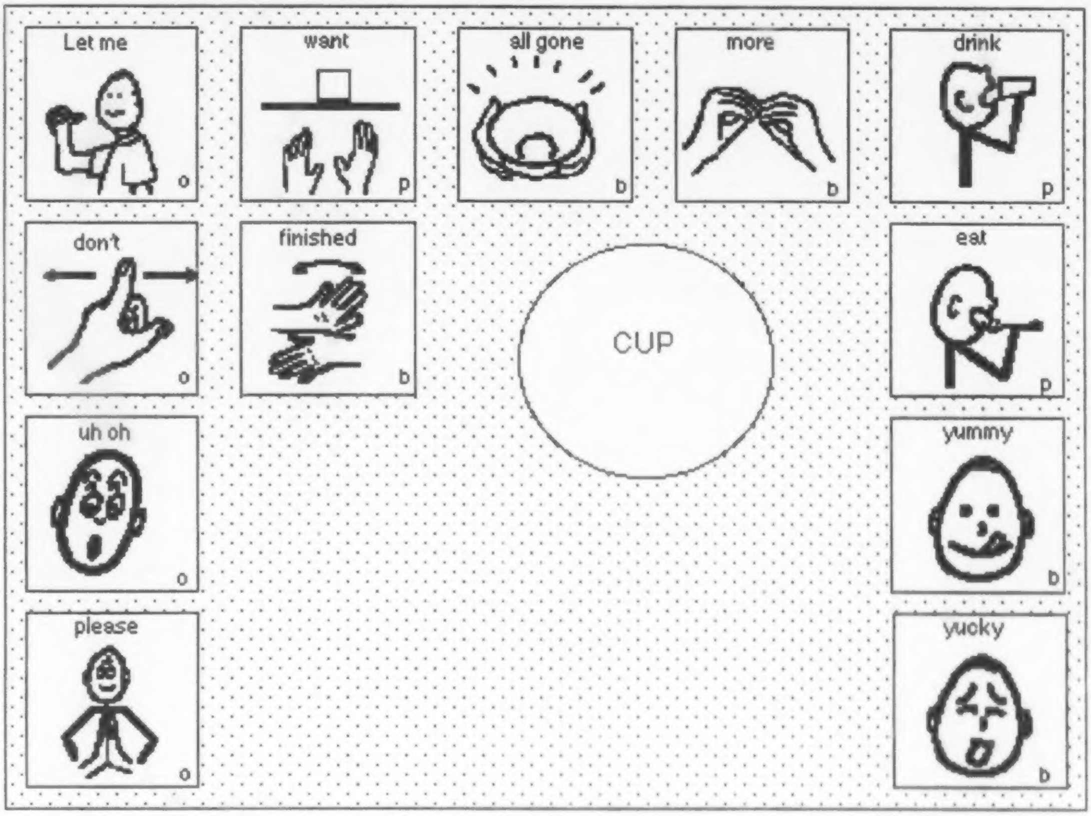
4) Copy, color and laminate the symbol for town. Place a small square of rough (male) velcro on the back, top center. Put it in the lower square on the bus. This symbol can then be removed and placed on a single message device in order for a child to participate by singing the repeated line of the song.

5) Copy, color and laminate symbols for nouns (yellow) and verbs (pink). You may start with traditional choices (mommy, baby, sister, etc.) and then extend into holiday themes. For example: the ghosts go Imo, witches go 'tee hee hee", Santa goes "ho ho ho", elves go "tap tap tap." Place rough (male) velcro on back.

6) Place two rows of soft (female) velcro (the length of the bus) on the back of the bus. Put the choices on the back of the bus. As children make choices, help them to move symbols to the appropriate space on the front of the bus. Sing the song. Encourage silly as well as traditional choices.



GENERIC PRESCHOOL SYMBOL PLACEMAT


Let me
o
want
p
all gone
b
more
b
drink
p
don't
o
finished
b
CUP
eat
p
uh oh
o
yummy
b
please
o
yucky
b

Directions:

1) Draw 2" symbols to match the vocabulary as illustrated. (You may use Boardmaker or PCS symbol book if you have it).
2) Color the backgrounds according to the color codes in the corner of each symbol (leave the symbol and the word white).
3) Cut a file folder or a piece of construction paper to size as needed. (File folders cut to 12 ½" by 13" work well.)
4) Cut out symbols and glue around the perimeter as shown.
5) Cut and glue on a small circle for cup and a larger circle for plate (optional).
6) Laminate to protect.

CREATING VOCBULARY DISPLAYS (Goossens', Crain & Elder, 1992)

When creating vocabulary displays for the 'engineered' preschool environment, focus initial attempts on overlaying AAC on activities that are already taking place within the classroom (Goossens', Crain & Elder, 1994).

1) Write down your daily routine and then list specific activities within each routine. Preschool classroom routines typically include the following: large group, small group, outside, snack, center-based play, and transitions. Activities may include: singing songs, choosing songs, bookreading, art projects, toileting, cooking, eating snack, group games, outside activities (e.g., bubble blowing, slide), and classroom centers (e.g., preparing the table in housekeeping, making a town with blocks, playing with legos).

2) Rank order these activities to delineate which ones you want to focus on initially. Plan to add symbol support first during the most interactive, fun activities. Continue to add support for the others as time and staff allow.

3) Choose 5 specific activities to get started.

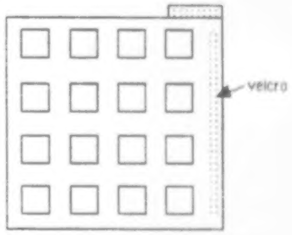
4) Brainstorm with as many team members as possible some specific words and phrases which may be used during these 5 chosen activities.

5) Rank order 32 of the words/phrases which will be represented symbolically.

6) Consider the abilities of the children in your class to determine the best way to display the symbols (16 location boards, eye gaze frames, various types of switches/devices used).

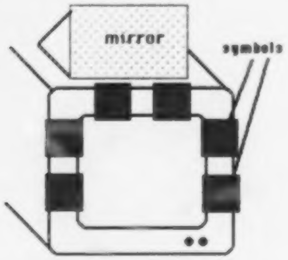
7) Choose symbols for each display you will be making, color-code, arrange on the chosen display format and laminate.

8) To design a 16 location display for aided language stimulation, either copy a pre-made display from Goossens', Crain & Elder (1994) or use your own list (created above).



9) Cut out the symbols and place evenly on a file folder or oak tag (about 13" square). Keep the symbols in this order: misc (orange), verbs (pink), descriptors (blue), prepositions (green), then nouns (yellow). Try to start a category at the top, with extra symbols carried across the bottom. Keep symbols that occur across multiple displays in the same location. Laminate. Put female velcro on the right side.

COMPUTER SUPPORT: SYMBOLS



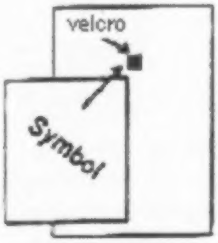
Symbols can be used at the computer to provide symbol and text support both generically (e.g., symbols for directions) and specifically (e.g., symbols to make choices or comment on specific off-the-shelf or special needs software).

1) Use symbol generating software such as Board Builder or Board Maker (Mayer Johnson Company).
2) Templates for 2" symbols or the Wolf 9-location overlays provide nice size.
3) Create generic symbols such as: Directional symbols plus words; MORE, GET IT, GO, STOP, TURN THE PAGE, TRASH IT.
4) Create software-specific symbols.
5) Prepare symbols by cutting them apart, coloring and laminating each.
6) Place square of male (hook) velcro on each.
7) Place female (loop) velcro around the screen of the computer.
8) Place a mirror above the screen to look at the students eye gaze at the computer.

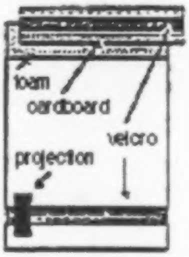
Computer Flap Switch (Musselwhite & King-DeBaun., 1997)

A flap switch is used to cover up unnecessary keys for successful computer use by children who have difficulty accessing single keys. Software which uses the space bar, command key or return keys work well with this modification.

1. Cut foam core art board 3 1/2" x 5".
2. Cut cardboard strip 3 1/2" x 1".
3. Cut hook and loop velcro, 3 1/2" x 1/2".
4. Cut hot gluestick 1/2" (projection).
5. Cut small square loop velcro
6. Make a "sandwich," gluing cardboard strip, foam strip and art board.
7. Add hook (male) velcro to cardboard strip.
8. Add loop (female) velcro at bottom of inside of flap switch.
9. Use a small piece of velcro to affix glue piece.
10. Place soft (female) velcro on top surface of the keyboard.
11. Place the flap switch over the keyboard.
12. Position the gluestick to depress one key (as determined by the software).



Flap Switch: Top View



Flap Switch: Bottom View

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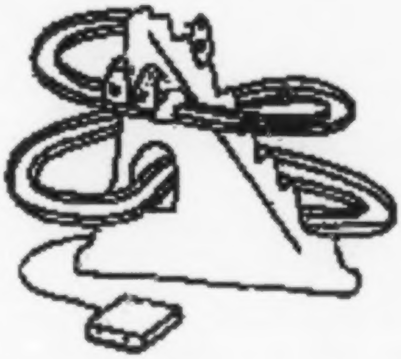
COUNTING WITH A SWITCH AND BATTERY POWERED TOY

(Burkhart, 1993)

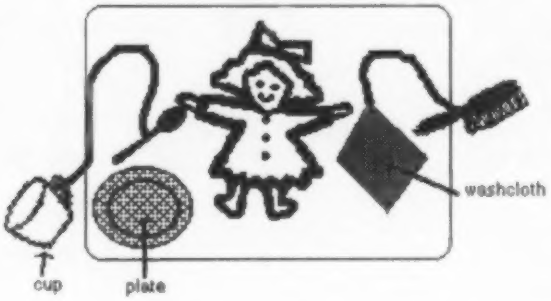
Use a battery toy that has multiple moving figures to count: penguins going down a slide, dolphins jumping through a hoop, cars going around a track, koalas that climb a tree and then slide down, etc.



1) Place a wad of "stick tac" or "blue tac" on the track about 6-8 inches down the slide from the top of the escalator as a stop for the penguins.
2) Slide the battery interrupter into the battery compartment and plug the switch into it. Make sure the switch on the toy is in the "on" position.
3) Space the penguins evenly on the stairs to allow more time between each.
4) Have the child activate the switch to get a specified number of penguins onto the slide. When that many penguins are on the slide, the child should release the switch. Most toys have just three penguins or figures, so if you are wanting to count higher than 3, buy several toys and use all the penguins on the one track.

EARLY PLAY BOARD

(Musselwhite & King-DeBaun, 1997)



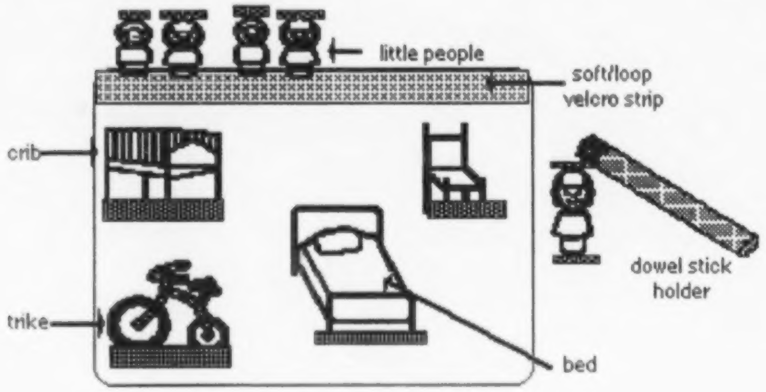
A play board is intended to permit easy access to play materials for students with physical disabilities. It can be mounted on the child's lap tray with velcro, or can be affixed to a slantboard, mounted to the play surface. An early play set offers large, realistic toys that can be used together.

1) Cut a piece of cardboard 10" x 14" (note: tri-wall is best)
2) Cover front with solid colored contact paper.
3) Affix stickyback female (soft) velcro la X 40 to mount doll, picnic plate, or other central play object.
4) Affix other play objects with velcro (e.g., small plate) or elastic, as appropriate to object.
   a) For velcro, use female (soft) velcro on playboard, male (rough) on toy.
   b) For elastic, use ¼" or round elastic, cut in 1 yard lengths. Tie one end around toy; make two small slits in playboard I' apart; insert end of elastic in first hole from front of playboard; bring through second hole, back through first, and out second; then tie second toy on end.
5) Add foam curler covers to handles of spoons, etc., to provide an easier surface for grasping.

MINIATURE PLAY SET (Musselwhite & King-DeBaun, 1997)

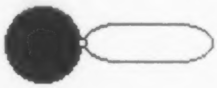
This play set is intended to permit easy access to play sets (e.g., Fisher Price sets) for students with physical disabilities. It can be mounted on a child's lap tray with velcro, or can be affixed to a slantboard, mounted to the play surface. A miniature play set offers access to normative symbolic play materials.

1) Cut a piece of cardboard (tri-wall) or indoor/outdoor carpet 10" x 14".
2) If using cardboard, cover front with solid colored contact paper and affix stickyback female (soft) velcro in places where you want to mount various objects (e.g., chair, crib, swing).
3) Affix stickyback male (rough) velcro to bottom of play objects.
4) Affix stickyback male (rough) velcro to head and feet of play people.
5) Make a "people holder" as follows: Cut a ½" piece of C-PVC pipe or dowel stick in a 5" length. Affix stickyback female (soft) velcro around people holder at one end.

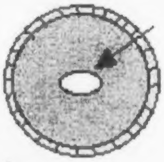


Battery Adapted Fan Spinner

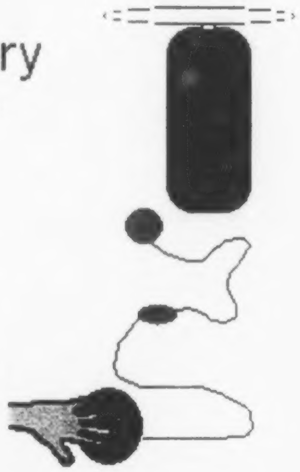
1. Remove cap from fan.
2. Remove both plastic blades.



3. Place one blade back in the fan, upside down. Replace cap.



4. Trace bottom of fan on a paper plate. Cut out hole.
5. Divide the plate into sections and color or add velcro for symbol choices.
6. Slide plate on from the bottom. Slide plastic stand under the plate to hold it in place.



7. Place battery interrupter in battery case. Insert switch plug into the battery interrupter.
8. Turn the fan to the "on" position.
9. Push the switch down, hold and release for random choices.

APPENDIX A

Assistive Technology Resources

AbleNet, Inc.
1081 10th Ave., S.E.
Minneapolis, MN 55414-1312
(800) 322-0957
www.ablenetinc.com

Adamlab
Regional Educational Service
Laboratory
P.O. Box 807
Wayne, MI 48184-2497
(313) 467-1610
(Wolf, Hawk, BlackHawk, SuperHawk)
www.wcresa.klz.mi.us/adamlab/index.htm

Adaptech
ISU Research Park
2501 N. Loop Dr.
Ames, IA 50010
(800) 723-2783

Adaptivation Inc.
224 S.E. 16th St., Suite 2
Ames, IA 50010
(800) 723-2783
(ActionVoice, light switches)
www.adaptivation.com

BeachWare
9419 Mr. Israel Road
Escondido, CA 92029
(619) 735-8945
(software on CD-ROM)
www.beachware.com

Berta Max (Educational Software Center)
P.O. Box 42859
Seattle, WA 98103
(IBM & Apple software)

Broderbund Software, Inc.
500 Redwood Blvd.
P.O. Box 6121
Novato, CA 94898-6121
(800) 521-6263
(Mac & IBM/PC software)
www.broderbund.com

Linda J. Burkhart
6201 Candle Court
Eldersburg, MD 21784
(books & IntelliPics software)
www.lburkhart.com

Creative Communicating
P.O. Box 3358
Park City, Utah 84060
(801) 645-7737
(Software for IBM, Mac, Apple,
PowerPad, IntelliKeys, switch)
www.creative-comm.com

Davidson and Associates, Inc.
P.O. Box 2961
Torrance, CA 90509
(800) 545-7677
(Software-Mac & IBM/PC)

Don Johnston, Inc.
P.O. Box 639
1000 N. Rand Road
Waconda, IL 60084-0639
(AT products & software)
www.donjohnston.com

Dunamis
3423 Fowler Blvd.
Lawrenceville, GA 80244
(800) 828-2443
(PowerPad & software)

Edmark Corp.
P.O. Box 3903
Bellevue, WA 98009-3903
(800) 426-0856
(Mac & IBM/PC software)
www.edmark.com

Exceptional Parent Magazine
Psy-Ed Corporation
209 Harvard St., Suite 303
Brookline, MA 02146-5005
(800) 247-8080
(annual AT issue)
www.eparent.com

Gallaudet Bookstore
800 Fionda Ave.
Washington, D.C. 20002-3695
(signed Storybooks)
www2.gallaudet.edu

Hach
P.O. Box 11754
Winston-Salem, NC 27116
(800) 624-7968
www.computersforkids.com

IntelliTools
55 Leveroni Court, Suite 9
Novato, CA 94949
(800) 899-6687
(IntelliKeys & software)
www.intellitools.com

Mayer-Johnson Co.
P.O. Box 1579
Solana Beach, CA 92075-1579
(619) 550-0084
(Symbols, resource and activity books)
www.mayer-johnson.com

Prentke-Romich Co.
1022 Heyl Road
Wooster, OH 44691
(800) 262-1984
(Alpha/Delta Talker, Liberator)
www.prentrom.com/index.html

Queue, Inc.
338 Commerce Dr.
Fairfield, CT 06430
(800) 232-2224
(Mac software)
www.queueinc.com

RJ Cooper & Associates
24843 Del Prado, Suite 283
Dana Point, CA 92629
(714) 240-1912
(single switch software, switch adapted mouse)
www.rjcooper.com

Sentient Systems
2100 Wharton St.
Pittsburgh, PA 15203
(800) 344-1778
(DynaVox 2, DigiVox)
www.sentient-sys.com

Simtech Publications
134 East Street
Litchfield, CT 06759-3636
(860) 567-1173
www.hsj.com

Southeast Augmentative Communication Publications
UCP of Greater Birmingham
2430 11th Avenue North
Birmingham, Alabama 35234
(205) 251-0165
(Displays & Theory Books)
www2.edc.org/NCIP

Special Communications
Caroline Ramsey Musselwhite, Ed.D
916 W. Castillo Dr.
Litchfield Park, AZ 85340
(602) 935-4656
(songbooks, minigrant book, RAPS)

TASH
Unit 1 – 91 Station St.
Ajax, Ontario, Canada L1S 3H2
(800) 463-5685
(switches, ECU's, computer accessories)
www.tashint.com

Thirdware
4747 N.W. 72nd Ave.
Miami, FL 33166
(305) 592-7522
(Fingerprint card – Apple)

Toys for Special Children, Enabling Devices
385 Warburton Ave.
Hastings on Hudson, NY 10706
(800) 832-8697
(switches, battery operated toys)
www.enablingdevices.com

UCLA Intervention Program For Handicapped Children
1000 Veteran Ave., Rm. 23-10
Los Angeles, CA 90024
(310) 825-4821
(Apple II Series Software)

Words+
40015 Sierra Highway
Building B-145
Palmdale, CA 93550
(800) 869-8521
(Message Mate, Pegasus Lite)
www.words-plus.com

Zygo Industries
P.O. Box 1008
Portland, OR 97207-1008
(800) 234-6006
(Macaw 3+, Lightwriter, switches)
www.zygo-usa.com

Websites

www.abledata.com (resources)
www.augcomm.com (resources)
www.apple.com/education/klz/disability (computers)
www.closingthegap.com (education; resources)
www.c4k.org (computer recycling program)
www.dragnet.org (computer recycling program)
www.cristina.org (computer)
www.at-center.com (computer freeware/shareware)
www.isaac-online.org (education; resources)
trace.wisc.edu

REFERENCES / RESOURCES

Alliance for Technology Access (1995). *Computer Resources for People with Disabilities.* Wauconda, IL: Don Johnston

American Speech-Language-Hearing Association (1989). Competencies for speech-language pathologists providing services in augmentative communication. *ASHA*, *31*, 107-110.

Attermeier, S. (1993). "Play". In P. Pierce (ed.), *Baby Power: A Guide for Families for Using Assistive Technology with their Infants and Toddlers.* Clinicial Center for the Study of Development and Learning (CDL), CB # 7255, BSRC, University of North Carolina at Chapel Hill, Chapel Hill, NC 17599-7255.

Beukelman, D. & Mirenda, P. (1992). *Augmentative and Alternative Communication: Management for Severe Communication Disorders in Children and Adults.* Baltimore, MD: Paul H. Brookes.

Burkhart, L. (1980). *,Homemade Battery Powered Toys and Educational Devices for Severely Handicapped Children.* Linda J. Burkhart, 6201 Candle Court, Eldersburg, MD 21784.

Burkhart, L. (1982). *More Homemade Battery Powered Toys and Educational Devices for Severely Handicapped Children with Suggested Activities.* Linda J. Burkhart, 6201 Candle Court, Eldersburg, MD 21784.

Burkhart, L. (1987). *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children.* Linda J. Burkhart, 6201 Candle Court, Eldersburg, MD 21784.

Burkhart, Linda J. (1993). *Total Augmentative Communication in the Early Childhood Classroom.* Linda J. Burkhart, 6201 Candle Court, Eldersburg, MD 21784; 410-795-4561.

Cook, A. & Hussey, S. (1995). *Assistive Technologies: Principles and Practice.* St. Louis: Mosby.

Cullinan, B. (1992). *Read To Me: Raising Kids Who Love To Read.* New York: Scholastic, Inc.

Cullinan, B. (1993). *Let's Read About: Finding Books They'll Love To Read.* New York: Scholastic, Inc.

Cutting, B. (1989). *Getting Started In Whole Language: The Complete Guide For Every Teacher.* Bothwell, WA: The Wright Group.

Exceptional Parent Magazine. Psy-Ed Corporation, 209 Harvard St., Suite 303, Brookline, MA 02146-5005 (800-247-8080). Includes an annual assistive technology issue.

Goossens', C., and Crain, S. (1992). *Utilizing Switch Interfaces With Children Who Are Severely Physically Challenged.* Pro-Ed, 8700 Shoal Creek Boulevard, Austin, TX 78758.

Goossens', C., Crain, S., and Elder, P. (1992). *Engineering the Preschool Environment for Interactive, Symbolic Communication, 18 months to 5 years developmentally.* Southeast Augmentative Communication Conference Publications, 2430 11th Avenue N., Birmingham, AL 35234.

Goossens', C., Crain, S., and Elder, P. (1994). *Communication Displays for Engineered Environments: Book I.* Southeast Augmentative Communication Conference Publications, 2430 11th Avenue N., Birmingham, AL 35234.

Goossens', C., Crain, S., and Elder, P. (1994). *Communication Displays for Engineered Environments: Book II.* Southeast Augmentative Communication Conference Publications, 2430 11th Avenue N., Birmingham, AL 35234.

Individuals with Disabilities Education Act Amendments of 1997 (IDEA). PL 101-476.

Johnson, S. (1993). "Adapting toys and using adaptive switches". In P. Pierce (Ed.), *Baby Power: A Guide for Families for Using Assistive Technology with their Infants and Toddlers.* Clinical Center for the Study of Development and Learning (CDL), CB # 7255, BSRC, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-7255.

Kelly, J. & Friend, T. (1993). *Hands-On Reading.* Solana Beach, CA: Mayer-Johnson Co.

Kelly, J. & Friend, T. (1995). *More Hands-On Reading.* Solana Beach, CA: Mayer-Johnson Co.

King-DeBaun, P. (1990). *Storytime: Stories, Symbols, and Emergent Literacy Activities For Young, Special Needs Children.* Park City: UT: Creative Communicating.

King-DeBaun, P. (1993). *Storytime Just For Fun.* Park City: UT: Creative Communicating.

King-DeBaun, P. (1993). *Storytime Holiday Fun.* Park City: UT: Creative Communicating.

King-DeBaun, P. (in progress). *Babes In Bookland: Early Storytime Fun.* Park City: UT: Creative Communicating.

Kraat, A. (1985). *Communication Interaction Between Aided and Natural Speakers: A State of the Art Report.* Toronto: Canadian Rehabilitation Council for the Disabled.

Lewis, L, Fitzgibbons, D., and Kearney, L. (1993). *Asistive Technology and Play for Infants and Toddlers.* Augmentative Communication Therapy, 2301 Rexwoods Drive, Suite 108, Raleigh, NC 27607.

Musselwhite, C. (1986). *Adaptive Play for Special Needs Children: Strategies to Enhance Communication and Learning.* Pro-Ed, 8700 Shoal Creek Boulevard, Austin, TX 78758.

Musselwhite, C. (1985). *Songbook: Signs and Symbols for Children.* Special Communications, 916 W. Castillo Dr., Litchfield Park, AZ 85340.

Musselwhite, C. & King-DeBaun, P. (1996). *Emergent Literacy Success: Merging Technology and Whole Language for Students with Disabilities.* Park City: UT: Creative Communicating.

Musselwhite, C. & St. Louis, K. (1988). *Communication Programming for Persons with Severe Handicaps.* Austin, TX: Pro-Ed.

Salpeter, J. (1992). *A Parent's Handbook: Kids and Computers.* SAMS: A division of Prentice Hall Computer Publishing, Carmel, Indiana.

Wright, C. & Nomura, M. (1985). *From Toys To Computers: Access for the Physically Disabled Child.* Order from: Christine Wright, P.O. Box 700242, San Jose, CA 95170.